ANNUAL REPORT
2021-22

Agricultural Water Management
for Sustainable Rural Development

ICID • CIID

INTERNATIONAL COMMISSION ON IRRIGATION AND DRAINAGE

News coverage of the 5th African Regional Conference and 72nd IEC Meeting, Marrakech, Morocco, November 2021.

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FOREWORD

As we graduate from "pandemic-related lockdowns and online activities" to a "new hybrid work culture," many realizations surface, and I would say that the future is a combination of both deliberately deterministic and unknown probabilistic events. Our greatest challenge is to maximize our dedicated deterministic efforts to minimize future uncertainties using all possible intellectual and physical resources at our disposal.

Reviewing and summarizing the ICID activities during this transition phase from April 2021 to March 2022, we can safely say that the ICID fraternity did its best to handle imposed restrictions on physical movements by most governments, frequent disruptions to the planned face-to-face activities, and a calibrated adoption of the "new normal." We remained in business and added new dimensions, notably two international online courses – one on the Dam and Network Safety and the other on Micro-irrigation Systems. ICID also participated in two relevant online courses organized by the African-Asian Rural Development Organization (AARDO) and the Government of Israel, respectively. I am intrigued to know that the World does not have a common inventory of large irrigation schemes of engineering significance. To fill this gap, ICID has launched an online Register of World Irrigation and Drainage Schemes. All project owners and other associated agencies or individuals are requested to provide information about their respective countries for populating the register. Irrigation generates 40% of the World's agricultural output from 20% of the land. Irrigation schemes of various sizes are the key harbingers of increased and sustainable output, and their contributions need to be recognized through their mention in the register. The entries are free and will earn contributor recognition in the Register. I hope that you all will join this new initiative wholeheartedly in making this effort a grand success.

The year (April 2021 – March 2022) started with the celebration of the 72nd Foundation Day of ICID through an online thematic event. Traditionally, climate change has been considered as a major challenge to the sustainability of agricultural water management and related food security issues of rapidly expanding and urbanizing human population. However, the COVID-19 pandemic and its unpredictable impacts have added yet another dimension to future uncertainties. As part of the Foundation Day, ICID organized a technical webinar aptly entitled "Sustainability of Agricultural Water Management under Difficult Circumstances" by inviting the subject-matter experts, its members, partners and stakeholders for stock-taking and knowledge-sharing. ICID President and several past and present Office Bearers joined the dialogue in which more than 250 participants from around the continents took part. ICID also collaborated with the World Bank in a web conference on the impacts of COVID-19 on agriculture as a part of our joint efforts to establish an Irrigation Service Providers' Network (INSPIRE).

In addition to Precision Irrigation, I would like to identify water harvesting and storage as an emerging response to minimize spatial-temporal variability of water availability for irrigation.

Capturing excess rainfall is the first choice for making additional water available during the dry season, obviously due to the historical evolution of rain-fed agriculture all over the world. Dams, rivers, streams, canals, and natural or people-made reservoirs are some of the waterscapes that have traditionally been used for precipitation storage and agricultural irrigation. As water scarcity becomes more common, our attention is focused more on creating water banks around major agricultural regions of a country or sub-regions. Two webinars which ICID organized in collaboration with Irrigation Australia, one of our most active national committees and the host of the 24th ICID Congress and 73rd IEC Meeting in 2022, covered the above issues in great detail. ICID organized and participated in several webinars and special sessions throughout the year, particularly with the Food and Agriculture Organization (FAO), International Water Management Institute (IWMI), the World Bank, International Water Resources Association (IWRA), International Geosynthetics Society (IGS), and other international and national collaborators.

ICID President and other Office Bearers frequently delivered thematic webinars and served as panelists in various online sessions organized by ICID and selected multilateral platforms on wide-ranging issues of our sector. The President facilitated a dialogue between ICID and several Arab states to enhance geographically diverse collaboration through ICID participation in the Arab Water Forum 2021. As a result, ICID signed an MoU with the Arab Water Council. Similarly, several other MoU's were signed by ICID, including with the International Center for Biosaline Agriculture (ICBA), International Center for Agricultural Research in the Dryland Areas (ICARDA), and African Asian Rural Development Organization (AARDO), to name a few; and many more are in the pipeline.

The Young Professionals Training and the 5th African Regional Conference were successfully organized at Marrakech, Morocco, in November 2021. However, the 72nd IEC Meeting had to be divided into two parts – the face-to-face one in Morocco and then online from the Central Office in India due to COVID-related travel emergencies announced during the events. Three new vice presidents were elected; WatSave Awards were virtually presented to the winners, and the nominated World Heritage Irrigation Structures (WHIS) were recognized during the IEC meetings. So far, ICID has recognized more than 100 WHIS that are more than 100 years old. The IEC's resolutions deliberated and passed are covered in this report.

Interestingly, the IEC meeting of ICID in Morocco initiated a knowledge-exchange collaboration between the Moroccan National Committee (ANAFIDE) and the Nigerian National Committee (NINCID) as a High-Level Nigerian delegation visited Morocco to observe and study local approaches to agricultural water management by touring various irrigation projects there. ICID welcomes such international collaborations among its stakeholders and will continue to do so in the future. During the year, ICID welcomed several high-profile visitors to the Central Office, including Hon'ble Ambassadors from Africa and Central Asia and world-renowned water policy experts. It was indeed heartening to witness the unceasing activities of our working groups, who leveraged the virtual platform to maintain the pace of their activities, surpassing their constraints.

ICID periodicals and other knowledge-sharing outputs were disseminated regularly at their scheduled times using a wide variety of print and electronic media and also through the ICID website. This Annual Report updates and consolidates the details of various activities that ICID network members, partners and collaborating institutions undertook over 2021-22.

As we settle into the "new" normal, I would like to urge that we all continue to carry out our business using online platforms and proactively grab opportunities for face-to-face physical events. We are working diligently to integrate a robust interactive module into our internet-based knowledge organization and dissemination initiatives.

I look forward to meeting you all at Adelaide in October 2022. In the meantime, please keep communicating and updating all within the ICID network.

Wishing to see you all at ICID Congress in Australia in October 2022 and subsequent events!

Ashwin B. Pandya
Secretary General, ICID

About ICID

The International Commission on Irrigation and Drainage (ICID) was established in 1950 as a leading scientific, technical, not-for-prof it organization working internationally in the field of irrigation, drainage and flood management to promote 'sustainable agricultural water management.' ICID strives to promote policies and programs to enhance the sustainable development of irrigated agriculture through a comprehensive water management framework. ICID is committed to enhancing the worldwide supply of food and fibre for all people.

ICID is a knowledge-sharing platform dedicated to improving the status of agricultural water management (AWM) practices, including rain-fed agriculture, supplemental irrigation, and deficit and full irrigation. The other core areas of activity focus on the drainage of agricultural lands and the management of extreme climate-induced disasters, such as floods and droughts.

VISION

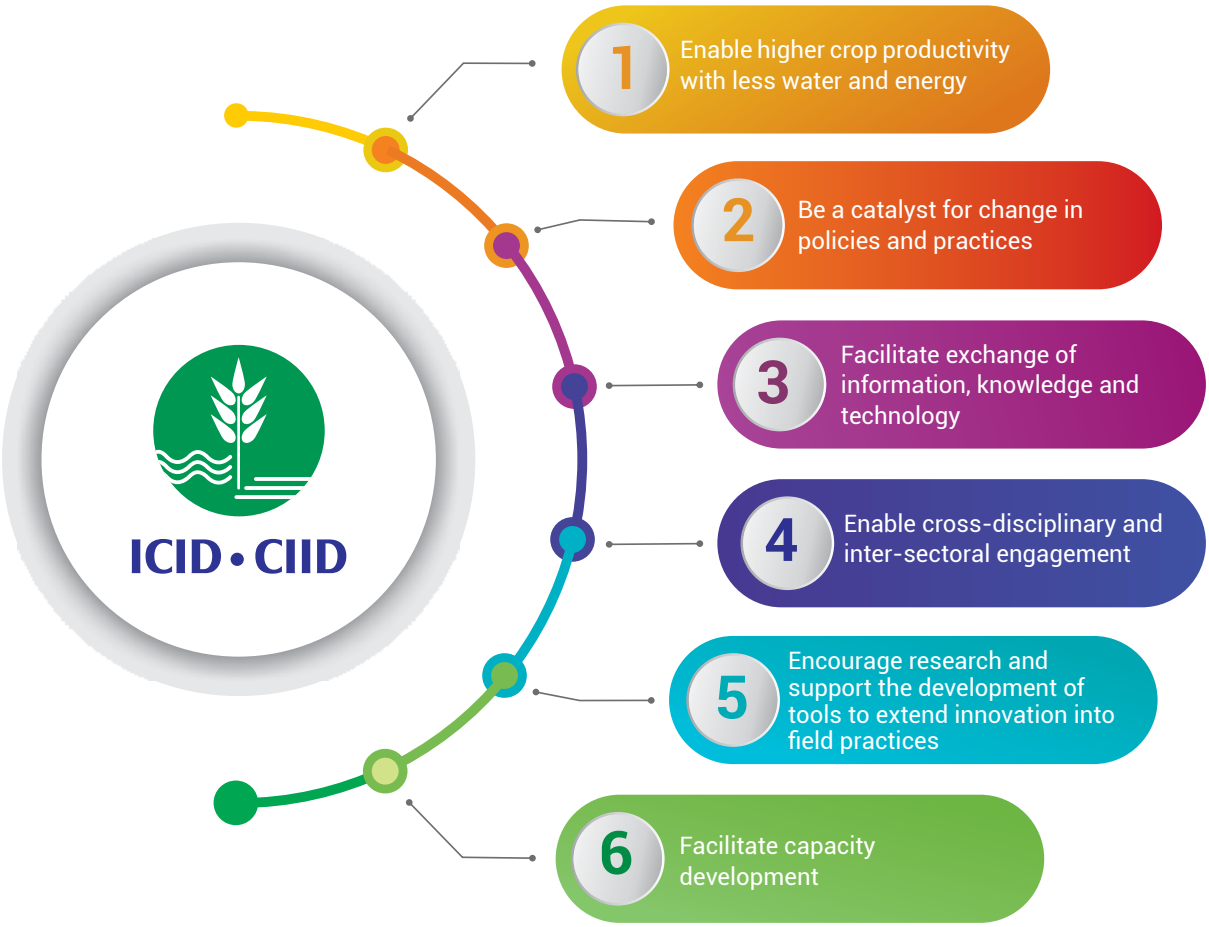
A water-secure world, free of poverty and hunger, achieved through sustainable rural development.

MISSION

To work towards sustainable AWM through inter-disciplinary approaches for economically viable, socially acceptable and environmentally sound irrigation, drainage, and flood management.

Organizational Goals

In order to fulfil the mission and realize Vision 2030, ICID has set the following six organizational goals:



We fulfil our mission through the generation exchange and dissemination of knowledge

ICID is a widely recognized knowledge-based international organization with global flagship programs in 'Irrigation and Drainage.' The Commission promotes its mission by pooling and sharing knowledge on the topics related to irrigation, drainage, and flood management, and then making it available worldwide; addressing emerging problems and challenges by promoting the evolution of suitable remedial measures; water-saving/conservation in agriculture; encouraging equity including gender equity between users and beneficiaries, and endorsing preservation and improvement of soil and water quality of irrigated lands. ICID provides a platform and brings various stakeholders and experts from diverse disciplines to deliberate on technical, agronomic, socio-economic, environmental, and managerial complexities for the development, management, and operation of irrigation, drainage, and flood management works. The aim is to attain sustainable AWM through exchanging experiences, ideas, and good practices and to promote them widely among the member countries and stakeholders. As a Knowledge Hub, ICID, through its technical working groups, generates knowledge by compiling and collating research data and disseminating them to all stakeholders through various channels.

ICID provides a unique platform to the participants related to AWM for the exchange of knowledge and information through the triennial International Congress on Irrigation and Drainage through deliberation on certain specific

Questions of irrigation and drainage, and the World Irrigation Forum (WIF) aims to bring together all the stakeholders involved in AWM. The objective of WIF is to exchange the latest irrigation and drainage policies, innovations, and technologies and advocate political commitments for sustainable irrigated agriculture. Regional issues and challenges concerning irrigation, drainage, or micro-irrigation are addressed at the Regional Conferences. ICID works in close collaboration with many international and regional organizations having similar objectives, such as FAO (Food and Agriculture Organization), IFAD (International Fund for Agricultural Development), IWMI (International Water Management Institute (IWMI)), World Bank, ADB (Asian Development Bank), UN-Water, WMO (World Meteorological Organization), UNDP (United Nations Development Programme), GWP (Global Water Partnership), WWC (World Water Council), ICRISAT (International Crops Research Institute for the Semi-Arid Tropics), ICARDA (International Center for Agricultural Research in the Dry Areas), AWC (Arab Water Council), WFO (World Farmers' Organisation), and AARDO (African-Asian Rural Development Organization), to name a few.

We address multi-disciplinary aspects of irrigation and drainage by synergizing all stakeholders

Fully recognizing the complexities of sustainable development, particularly related to AWM, while preserving the environment and promoting social equity, ICID gradually changed its focus from merely technical issues to include other related disciplines such as environment, socio-economic, capacity building, and sustainable rural development.

The Commission, with active support from its members and stakeholders, provides an international forum and network (World Irrigation Forum) in which the technical, agronomic, socio-economic, environmental, and managerial complexities are involved in the development, management, and operation of irrigation, drainage, and flood management areas are discussed. The questions addressed by various triennial Congresses <http://www.icid.org/past_congresses.html> indicate a progressive shift from deliberating on purely technical questions to global water and food-related issues and sustainability of development.

To achieve this purpose, ICID draws together diverse disciplines and a pool of over 500 eminent professionals/experts involved in the field of irrigation, drainage, and flood management from all over the world. These professionals, through technical and strategic work bodies, address topics of current importance in developing/emerging and developed countries and assist to bring out various publications, reports, manuals, and position papers on various specialized topics.

ICID works towards creating a synergy between agriculture and water policies and increased investment both from public and private sources for sustainable development of irrigation and drainage. As farmers are at the core of agricultural water use and the principal stakeholders, ICID, therefore, promotes Participatory Irrigation Management (PIM) and Management Transfer (MT) to enhance the performance of irrigation schemes.

Organization Structure and Management

ICID has a membership of about 80 countries spread across the world and promotes its activities through its network of National Committees (NCs), like-minded international organizations, private companies, institutions, and individual professional members. The membership of the Commission primarily comprises of NCs representing their member countries. NCs generally include multi-disciplinary professionals such as planners and policymakers, water managers, irrigation and agriculture engineers, research scientists, and educationists working in the related areas. Companies, institutions, and individuals can also participate in ICID activities through their respective NCs or as Direct Members (DM). Presently, the ICID membership network covers over 90% of the irrigated area of the world. Direct Membership is also available for countries that are not a member of ICID, provided such members abide by the constitution of ICID.

ICID achieves its mission through the voluntary contribution of experts from the NCs, Direct Members, and Partner Organizations. An International Executive Council (IEC) supported by the Management Board (MB) governs its activities. The Commission is presently assisted in its strategic, administrative, and technical matters by three Administrative Committees, three Permanent Committees, four Regional Working Groups, twenty-one Technical Working Groups, and Task Forces.

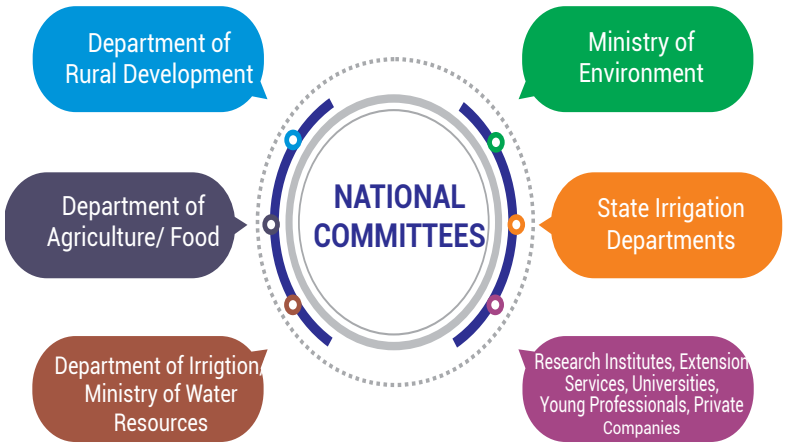
International Executive Council

The International Executive Council (IEC), is composed of President, Secretary-General, nine Vice Presidents, and one representative from each active NC and Office Bearers (OB). All are vested with the management of the affairs of the Commission.

The Council meets each year to take up all the matters of policy that may be initiated or sponsored by any member of the NCs, OBs, or by the MB and might itself initiate or otherwise advise and lay down any matter of policy. All matters affecting the executive or administrative function and financial liabilities of ICID are placed before the Council, whose decisions are conclusive. IEC is presided over by the President, who is also responsible for the direction of the Central Office. The Secretary General, the Chief Executive Officer (CEO), also serves as the Treasurer of the Commission.

National Committees

National Committees (NC) are the building blocks of the Commission and the main vehicle for advancing its mission. Any geographical area independently administered by a sovereign government and having an interest in the activities of the Commission is eligible to become a member by establishing an NC. NCs comprise a wide network of representatives of experts from the government, technical and scientific organizations, non-government institutions, irrigators, companies, and individuals with interest in, concerned with, or desirous of promoting and furthering the mission and goals of the Commission.



NCs are generally hosted by the government departments of irrigation, water resources, agriculture, or rural development and provide a multi-disciplinary platform within the countries, bringing together all the relevant stakeholders.

ICID publication titled 'A Roadmap to ICID Vision 2030' identified several activities to be undertaken by the network, especially NCs, under the four categories – (i) Strengthening of the ICID Network and NCs, (ii) Collective Network Knowledge Management, (iii) Organizational changes in the network, and (iv) Enhanced visibility of ICID activities. National Committees, the backbone of the ICID network as they represent various stakeholders engaged in different facets of AWM in their respective countries, serve as the common platform for various AWM stakeholders in implementing sustainable development agenda within their countries, particularly with respect to meeting the goals of poverty alleviation, food security and sustainable water management and other related SDGs in the context of Climate Change.

NCs disseminate the generated knowledge and share them on the ICID platform with the national stakeholders by organizing national activities, annual conferences, workshops, seminars, or publications in their respective countries.

Direct Members

Professionals, individuals, and officers of a government or of an institution or institutions - government and non-government; and companies, effectively representing interests within the scope of the objects of the Commission can participate in ICID activities through Direct Membership (DM) to further the objects of the Commission in their countries or sovereign areas. For more information, please visit https://icid-ciid.org/member/direct_member

Management Board

The Management Board (MB) comprises the President, immediate Past President (for one year only), Chairpersons of the Permanent Committee on Technical Activities (PCTA), Permanent Finance Committee (PFC), Permanent Committee on Strategy and Organization (PCSO), and the Secretary-General. The Management Board (MB) is responsible for the implementation of the decisions made by the Council through the Central Office (CO) and also decides actions in between Council meetings that are necessary to properly steer the functioning of the Commission.

Permanent Committees

Permanent Committee on Strategy and Organization

Permanent Committee on Strategy and Organization (PCSO), as the name suggests, develops the strategy of the Commission and is concerned with increasing the membership and assisting the National Committees to become more active in their respective countries to achieve the goals set for them from time to time. The Committee also undertakes issues related to strategic planning for ICID and coordinates the activities of Vice Presidents in their respective areas. Presently, PCSO is chaired by Vice President Dr. Mochammad Amron (Indonesia) from 2021.

Permanent Committee for Technical Activities

Permanent Committee for Technical Activities (PCTA) guides the technical activities of the Commission. It guides the activities of the technical working groups, selects Questions for Congresses, themes for World Irrigation Forum, Conferences, Special Sessions, Symposia, and thereon makes appropriate recommendations for the actions to be taken. Presently, PCTA is chaired by Vice President Dr. Tsugihiro Watanabe (Japan) from 2021.

Permanent Finance Committee

Permanent Finance Committee (PFC) guides all the financial matters of the Commission. It reviews the receipts and expenditures of the Commission, advises the Council on budgetary allocations, and recommends the rate of annual subscriptions and other support from the participating countries. It guides the Secretary-General on the rudiments to be taken into account while preparing the annual budget. Presently, PFC is chaired by Vice President Hon. Marco Arcieri (Italy) from 2020.

Central Office

The Secretariat of ICID, known as the Central Office (CO), is located in New Delhi, India. Secretary-General, as the Chief Executive Officer, is responsible for the day-to-day affairs of CO and is assisted by a small dedicated team. A Staff Committee (SC) reviews and formulates the work procedure and the staff structure of CO, keeping with the dynamic requirements, and advises the Secretary-General. The Staff Committee comprises President, Chairman, PFC; Chairman, Indian National Committee of Irrigation and Drainage (INCID) and the Secretary-General.

The Central Office facilitates a knowledge-sharing platform by hosting the ICID official website (www.icid.org) to fulfil its mission. CO also facilitates and coordinates virtual and annual meetings of various work bodies and IEC by compiling agenda items and minutes. It also disseminates knowledge by bringing out in-house periodicals such as e-Bulletin (weekly), News Update (monthly), and ICID News (quarterly) regularly, both in English and French (ICID official languages). It also houses a technical library having a wide collection of technical books, reports, proceedings, periodicals, and ICID publications.

To reduce the carbon footprint, the Central Office is being maintained as a green building with the provision of a solar energy generation system commissioned in 2015. Other eco-friendly measures include rainwater harvesting and using treated wastewater/untreated fresh water for gardening purposes.

ICID Membership Network

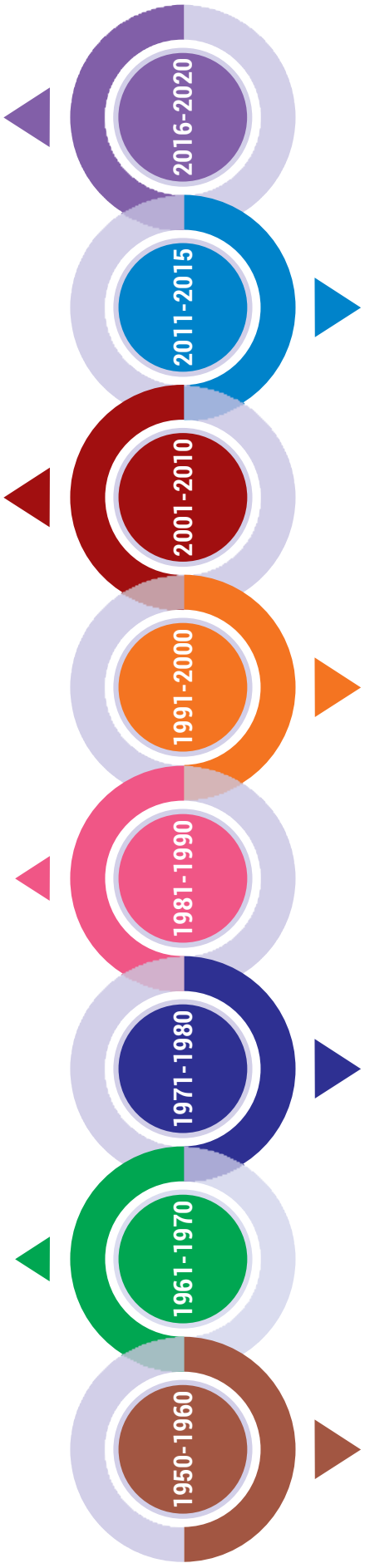
Sl. No.	National Committees	Acronym	Year of Joining
1.	Afghanistan	AFGICID	2018
2.	Australia	IACID	1952
3.	Bangladesh	BANCID	1973
4.	Burkina Faso	CNID-B	2014
5.	Canada	CANCID	1956
6.	China	CNCID	1983
7.	Croatia	CRCID	1993
8.	Egypt*	ENCID	1950
9.	Estonia	ESTICID	2001
10.	Fiji	FIJICID	2010
11.	Finland	FINCID	2000
12.	France	AFEID	1953
13.	Georgia	GENCID	2018
14.	Hungary	HUCID	1955
15.	India*	INCID	1950
16.	Indonesia*	INACID	1950
17.	Iran	IRNCID	1955
18.	Iraq	IRQCID	2006
19.	Ireland	IRCID	1978
20.	Italy*	ITAL-ICID	1950
21.	Japan	JNC-ICID	1951
22.	Kazakhstan	KAZCID	2006
23.	Malawi	MALCID	1967
24.	Malaysia	MANCID	1958
25.	Mali	AMID	2005
26.	Mexico	MXCID	1951
27.	Morocco	ANAFIDE	1959
28.	Myanmar	MNCID	1962

Sl. No.	National Committees	Acronym	Year of Joining
29.	Nepal	NENCID	1973
30.	The Netherlands*	NETHCID	1950
31.	Nigeria	NINCID	1970
32.	Pakistan	PANCID	1953
33.	Philippines	PNC-ICID	1956
34.	Portugal	PNCID	1954
35.	Romania	CNRID	1992
36.	Russia	RUCID	1955
37.	Saudi Arabia	SACID	1977
38.	Slovenia	SINCID	1992
39.	Somalia	SONCID	2017
40.	South Africa	SANCID	1993
41.	South Korea	KCID	1969
42.	Spain	CERYD	2021
43.	Sri Lanka*	SLNICID	1950
44.	Sudan	SNCID	1964
45.	Tajikistan	TajNCID	2014
46.	Thailand*	THAICID	1950
47.	Turkey*	TUCID	1954
48.	Ukraine	UACID	1996
49.	United Kingdom	IWF/ICID. UK	1951
50.	United States of America	USCID	1951
51.	Uzbekistan	UzNCID	1994
52.	Vietnam	VNCID	2018
53.	Zambia	ZACID	1966
	Committee		
54.	Chinese Taipei	CTCID	1969

ASSOCIATE MEMBERS: Algeria, Austria, Brazil*, Bulgaria, Chad, Czech Republic, Ethiopia, Germany, Greece, Guyana, Israel, Kenya, Kyrgyz Republic, Lithuania, Macedonia, Madagascar, Mozambique, Niger, Poland, Serbia (erstwhile Yugoslavia*), Slovak Republic, Switzerland*, Syria, Tanzania, Tunisia, Uruguay, Zimbabwe.

* Founder Member

MILESTONES IN THE HISTORY OF ICID



- Organized Virtual 72nd IEC Meeting, 2021
- Established Register of the World Irrigation and Drainage Schemes, 2021
- Launched ICID e-Learning Platform in 2020 and Organized Courses on Dam Safety; and Micro Irrigation, 2021
- Established Services Unit of ICID, 2019
- Organized Virtual 71st IEC Meeting, 2020
- Released ICID@70 Coffee Table Book, 2020
- Launched New Website, 2020
- Launched African Young Water Professionals e-Forum (Af-YWPeF), 2019
- Launched World Water System Heritage Programme (WSH), 2018
- Launched "A Roadmap to ICID Vision 2030", 2017
- Established ICID Webinar Services, 2017

- Renamed International Micro Irrigation Symposium as International Micro Irrigation Conference, 2015
- Established ICID Young Professionals e-Forum (IYPeF), 2015
- Released web version of the Multilingual Technical Dictionary (MTD), 2015
- Organized First World Irrigation Forum (WIF1), 2013
- Established Scheme for Recognition of Heritage Irrigation Structures (HIS), 2013
- Established Scholarships to Young Professionals, 2013
- Micro Irrigation Congress renamed as International Micro Irrigation Symposium 2012
- Direct Membership to Companies /Institutions and Individuals, 2012
- Established World Irrigation and Drainage Prize, 2012
- Elected to WWC Board of Governors, 2012
- ICID e-Bulletin (English & French) started, 2012

- Released MTD CD-ROM in multiple languages in 2010
- Release Special Postal Cover on 60th Anniversary, 2009
- Country Policy Support Program (CPSP), 2002-2007
- Start of Best Paper Award, 2006 o Best Performing WB and NC award, 2003
- Released 1st Edition of MTD CD-ROM, 2001
- Renamed ICID Journal as "Irrigation and Drainage", 2001

- Guidelines on Benchmarking, 2000
- Release of Special Postal Cover on Diamond Jubilee Year, 2000
- Launch of Website, 1999 o Start of WATSAVE Awards 1998
- ICID Journal started, 1995
- Young Professional Forum (YPF) established, 1994
- Global Water Saving/ Conservation Program initiated, 1993
- Change of Logo, 1992

- IPTRID started, 1990
- ICID News Update started, 1990
- Joint Publication with World Bank, 1989
- Received UN Peace Messenger Award, 1987
- ICID Newsletter started, 1986
- First Worldwide Micro-Irrigation Survey, 1982
- N.D. Gulhati Lecture started, 1981

- First Irrigation and Drainage Workshop, Wageningen, 1978
- Joint Publication with FAO, 1975
- Release of Special Postal Cover on Silver Jubilee Year, 1975

- Multilingual Technical Dictionary (MTD) released, 1967
- Central Office building inaugurated by the then Vice President of India, Dr. Zakir Hussain, 1966

- Irrigation and Drainage - A Global Review, the First Publication released, 1955
- ICID Bulletin started, 1952
- First Congress organized in New Delhi, India, 1951
- Change of name as International Commission on Irrigation and Drainage, 1951
- First International Executive Council (IEC) meeting in Shimla, India, 1950
- Established on 24 June 1950 as International Commission on Irrigation and Canals, with 11 founding member countries

Working Together

NATIONAL COMMITTEES/ COMMITTEE

Majority of ICID's National Committees (NCs), are generally hosted by the government departments of irrigation, water resources, agriculture, or rural development or stakeholders engaged in different facets of AWM in their respective countries, are the Commission's core that helps achieve the ICID Vision and Mission 2030. NCs also provide a multi-disciplinary platform within the countries, bringing all the relevant stakeholders on board. They serve as the common platform for various AWM stakeholders in implementing sustainable water resources development and management agenda within their countries, particularly for meeting the goals of poverty alleviation, food security, sustainable water management, and other related SDGs in the context of climate change.

ICID relies significantly on the collective wisdom of its members and partner organizations to apply resources and efforts to achieve its mission and goals in a spirit of partnership, cooperation, and sharing. To promote this spirit of partnership, NCs are called upon to host IEC meetings, Congresses, World Irrigation Forum, and Regional Conferences, etc. in rotation. They also organize activities in their respective countries to implement various action programs of their own or promoted/sponsored by the Commission. ICID consciously ensures that all NCs assume essential roles as partners in progress and make valuable contributions to the network. Some of the highlights of the activities of the NCs during the year 2021-2022 are presented below:

Irrigation Australia's Committee on Irrigation and Drainage (IACID)

The impact of the COVID-19 pandemic resulted in the postponement of the 24th International Congress and 73rd IEC Meeting, originally scheduled to be held in Sydney in September 2020. Two further postponements have now been made to ensure that the event can be held in a safe environment and that international travel to Australia will be possible. The event will now be held in Adelaide, South Australia, from 3 to 10 October 2022. IACID members are looking forward to welcoming ICID delegates to Adelaide for this event, and for further information, please visit the event website at https://www.icid2022.com.au/. Simultaneously, IACID sought expressions of interest for an Australian Young Irrigation Professionals (YIP) network and received many expressions of interest. A sub-committee has now been formed within IACID to help establish the network.

In July 2021, ICID, in coordination with Irrigation Australia, organized a webinar on "Organization of Irrigation Automation Systems." The speakers and panellists of the events were: Dr. Iva Mareels, Director of the Centre for Applied Research, IBM Australia; Dr. Danlu Guo, Research Associate at the Infrastructure Engineering Department at the University of Melbourne; Er. Paul Byrnes, Director of PAQUA Consulting, and Er. Damien Pearson - Global Business Development Manager with Rubicon Water. This webinar was about the Australian modernization journey, which can provide valuable dimensions for water resource managers and how they improve the management and efficient use of their water resources.

ICID also collaborated with Kingspan Water and Energy, Australia, to organize a second webinar on "Rainwater Harvesting vs Traditional Catchment Storage". The speakers and panellists of the event were: Er. Michael Smit - Technical and Sustainability Manager at Kingspan Water and Energy, Australia, and Er. Geoff Harvey - Head

Working Group on Rain Water Harvesting (WG-RWH). In the webinar, Er. M. Smit talked about the importance of the design, quality, and maintenance of rainwater harvesting systems. He also presented data on the relative efficiencies of a traditional rural catchment and rainwater harvesting based on similar volumes and frequencies of rain. In this context, rainwater harvesting is rainfall captured from the roof of a building. The data suggests that in dry conditions, rainwater harvesting is much more efficient at catching small rain events and storing small amounts of local water than traditional catchments. However, in wet conditions, catchments can capture large rainfall events and store large amounts of water. President Ragab shared the experiences of earlier droughts in the UK and Europe and suggested that clear legislation and policy on rainwater harvesting are crucial to promoting it not only in agricultural fields but also in building structures of various kinds. Many governments are also now promoting Public Private Partnerships for scaling up the rainwater harvesting structures and systems.

Bangladesh National Committee of ICID (BANCID)

Bangladesh High Commission, Secretary (Political) Mr. Zakaria Bin Amjad visited the ICID Central Office on 21 June 2021 and received a warm welcome. He interacted with Secretary-General Er. Ashwin Pandya and Executive Director Er. Harish Varma. SG Pandya briefed him about the ICID, its vision, and the role of ICID in irrigation, agriculture, food security, and water management. He also explained the strategies to achieve ICID goals. Mr. Zakaria Bin Amjad appreciated the work of ICID and its knowledge-sharing platforms. BANCID appointed a new Chairman - Mr. Fazlur Rashid - who also took over the charge of the Director-General of Bangladesh Water Development Board.

Chinese National Committee on Irrigation and Drainage (CNCID)

CNCID will host the World Irrigation Forum 4 (WIF4) in Beijing in April 2023. CNCID members are actively contributing to several ICID Working Groups and Task Forces, including ASRWG, CLIMATE, EB-JOUR, ENV, HIST, IDM, IOA, LDRG, M&R, MTD, MWSCD, NCWRI, SDTA, SON-FARM, WEF_N, and WWF-9.

On the invitation of CNCID, President Prof. Dr. Ragab Ragab participated virtually in the Water Resources Forum of the Fifth China-Arab States Expo organized on 18 August 2021, at Yinchuan, China. The event is aimed at exploring the possibility of a water cooperation mechanism incorporating countries, regions, organizations, and enterprises, strengthening the water policy and innovation exchanges between China, the Arab region and other countries along the Belt and Road, encouraging the transfer of advanced water technologies, and promoting practical cooperation in the field of intensive and safe use of water resources. President Ragab made a virtual presentation and introduced ICID and its role in fostering the development of irrigation, drainage, and flood management and bolstering global food security. The event was graced by the presence of the Vice Minister of Water Resources of China, President of the Arab Water Council, Sudanese Ambassador to China, and other invited dignitaries also delivered video speeches.

Egyptian National Committee of Irrigation and Drainage (ENCID)

ENCID actively contributes to the technical workbodies of the ICID. ENCID took a major role in organization of the 5th African Young Professional's Forum during the Cairo Water Week 2021.

The functioning of the integrated unit for sewage treatment designed and operated by CMRI/NWRC was reviewed. The electronic connection database program for maintenance work of waterways in the MWRI irrigation and drainage departments at the country level was evaluated. Findings of the Fourth African Youth Forum on the sidelines of Cairo Water Week 2021 were presented, and a presentation on "The Importance of Using Water Quality Indicators - Advantages and Disadvantages for reuse purposes was made. Findings to rehabilitate the irrigation system and water management in Minya and Fayoum were also presented. The activities of the Wadi El-Natrun Experimental Research Station (WMRI) were reviewed and the application of the Smart Irrigation System was demonstrated.

Finnish National Committee (FINCID)

The Finnish National Committee contributes to the technical working groups of WG-ENV, WG-AFM, WG-LDRG, WGCLIMATE, and EB-JOUR and also participates in the regional activities of the ERWG.

French National Committee (AFEID)

The French National Committee (AFEID) contributes to the technical working groups of WG-LDRG, EB-JOUR, TF-WFF9, and WG-VE, and also participates in the regional activities of the ERWG.

Georgia National Committee (GNCID)

Ms. Nata Khutsurauli was appointed as the new Secretary of the Georgian National Committee on Irrigation and Drainage (GENCID). She is a Leading Specialist in the "Donor Organizations Projects Coordination Office" under "Projects Management Department" at "Georgian Amelioration Ltd." of the "Ministry of Environment Protection and Agriculture of Georgia." Mr. Levan Tabatadze has been appointed as the new Head of the "Projects Management Department" of the Georgian National Committee on Irrigation and Drainage (GENCID).

Indian National Committee (INCID)

Dr. R. K. Gupta has been appointed as the new Chairman of the Central Water Commission (CWC) of India and the INCID. INCID, in collaboration with WALMIs/IMT, CWC, and Indian members of ICID WG-CDTE, jointly developed a Webinar Series, named the Water and Land Management Institutes WALMI-Meet 2022, which commenced in February 2022.

INCID will organize the 25th ICID Congress and the 75th IEC meeting in 2023 as per the approval of the IEC. INCID members are active in several ICID Working Groups, including AFM, ASRWG, CDTE, CLIMATE, EB-JOUR, HIST, IDM, IDSST, LDRG, MWSCD, NCWRI, RWH, SDTA, SON-FARM, WATS, and WEF_N.

Indonesian National Committee (INACID)

The Indonesian National Committee on Irrigation and Drainage (INACID) is contributing to the work-bodies WG-SDTA, WG-M&R, WG-LDRG, WG-IOA, WG-HIST, PCSO, PFC, and C-CONGR, and also participates in the regional activities.

Italian National Committee (ITAL-ICID)

Dr. Marco Arcieri is presently the Secretary-General of the Italian National Committee on Irrigation and Drainage (ITAL-ICID). Dr. Marco participated in the Arab Water forum, a flagship event of water authorities from 22 Arab countries and reprsented ICID in technical sessions. Dr. Marco was there as a member and representing Chair, ERWG.

Iranian National Committee (IRNCID)

On 16 June 2021, in a video conference with Mr. Mehrzad Ehsani, Secretary-General of the IRNCID, the Irrigation and Drainage Regional Committee of Qazvin Province was inaugurated, and the rulings issued by the Iranian National Committee on Irrigation and Drainage were presented to members. Mr. Mehrzad Ehsani, Secretary-General of IRNCID, while explaining the activities and goals of the IRNCID and emphasized on considering the potential of Qazvin Province, and to form a Regional Committee in this Province. He considered it important to expand the activities of the National Irrigation and Drainage Committee of Iran in all the provinces and follow up the approvals of the relevant working groups, and obtain information, knowledge, and awareness of irrigation and drainage issues in different regions of the country.

Recently, IRNCID has issued two publications: (i) Annual Report 2019-2021, (ii) An Approach on the Concept of Irrigation Efficiency, and 4 Newsletters. Also, IRNCID organized 5 Technical Workshops.

Er. Alireza Salamat was elected as a new Vice President of ICID during the 72nd IEC Meeting, in November 2021. Presently, he is Deputy for International Affairs, Ministry of Energy, Islamic Republic of Iran. Mr. Mohammad Javanbakht was appointed as the new Chairman of the IRNCID. He is also the Deputy of the Energy Ministry and Managing Director of Iran Water Resources Management Company (IWRM).

Japanese National Committee (JNCID)

Prof. Dr. Tsugihiro Watanabe was elected as a new Vice President of ICID during the 72nd IEC Meeting in November 2021, and he was also chair of ASRWG, and a Member of PCTA, TF-WWF9. He was also actively involved and contributed to the ICID Working Groups on CLIMATE, DROUGHT, IADWS, PERF and ST-LCB. Mr. Hiromichi Kitada was appointed as the new Secretary of the JNCID. He also serves as the Director of Overseas Land Improvement Cooperation Office in Japan's Ministry of Agriculture, Forestry and Fisheries (MAFF).

Moroccan National Committee (ANAFIDE)

Er. Aziz Fertahi (President, ANAFIDE) was elected as a new Vice President of ICID during the 72nd IEC meeting in November 2021. He holds four positions in various capacities: 1. Director of LABOROUTES; 2. President of ANAFIDE; 3. President of Regional Branch of the Moroccan General Confederation of Enterprises (CGEM) 4. Vice President, National Association of Buildings and Civil Engineering Laboratories. He has 25 years of experience in rural infrastructure in irrigated and micro-irrigated zones. The 72nd IEC meeting held in Morocco initiated a knowledge-transfer collaboration between the ANAFIDE and the Nigerian National Committee on Irrigation and Drainage (NINCID). A high-level Nigerian delegation visited Morocco to observe and study local approaches to agricultural water management by touring various irrigation projects there. ICID welcomes such international collaborations and will continue to do so in the future. ANAFIDE will host the 10th International Micro-Irrigation Conference at Dakhla in January 2023.

Nepal National Committee (NENCID)

The Nepal National Committee (NENCID) has proposed nominations in various ICID Working Groups, including AFM, CLIMATE, HIST, NCWRI, and WFE_N.

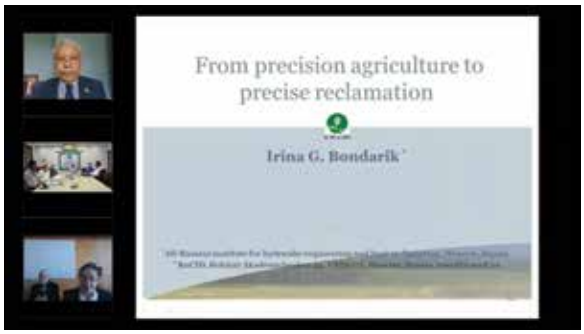
Nigerian National Committee (NINCID)

The Nigerian National Committee (NINCID) is contributing to the work bodies WG-MWSCD, WG-HIST, WG-IDSS, WGM&R, and WG-IOA, and also participates in the regional activities of the AFRWG. A study tour was also organized to Morocco which includes high-level delegation to observe and study local approaches to agricultural water management by touring various irrigation projects.

Pakistan National Committee (PANCID)

The 51st Meeting of PANCID was organized on 24th November 2021 at the CEA/CFFC, Islamabad, under the chairmanship of the Secretary PANCID. The meeting outcomes included (a) Revision/Review of PANCID Membership in Various Working Groups of ICID, (b) Circulation of ICID's Journal Irrigation and Drainage among PANCID members, and (c) Submission of Research Papers from Pakistan to ICID Events and the Journal.

Russian National Committee (RUCID)



As part of knowledge dissemination, RUCID successfully organized two webinars, (i) Webinar on Integrated Water on Resources Management in Large River Basins Based on Simulation Modeling and Optimization Methods, 16 February 2022; and (ii) Webinar on Precise Land Reclamation as a Tool of Precision Agriculture, President Prof. Dr. Ragab Ragab gave the opening remarks. Dr. Ragab mainly focused on the importance of GPS technology, which can be used to increase the output in terms of food, lower water consumption, support soil health, and lower inputs and greenhouse emissions. He also talked about how GPS/GIS technology identifies the level of input required for doubling the food production needed by 2050, when our population may reach 9 billion. 16 March 2022. Dr. (Mrs.) Irena G. Bondarik as the Secretary-General, RUCID.

Somalia National Committee (SONCID)

The Somalia National Committee (SONCID) is contributing to the working body of WG-AFM, and it also participates in the regional activities of AFRWG.

South Africa Committee of Irrigation and Drainage (SACID)

In August 2021, ICID jointly collaborated with the South Africa Committee of Irrigation and Drainage (SACID) and Water Research Institute (WRC) to organize the webinar on "Dialogue: Enhancing water security through improved agricultural water productivity: new knowledge, innovations, and applications." A panel of experts joined the discussion, including the President Prof. Dr. Ragab Ragab. During the panel debate, President Ragab Ragab addressed current water issues requiring rational management of supply and demand. The panel discussed how crop diversity could improve water productivity by examining cereal and legume intercrop systems, and also addressed the effective use of irrigation water using automatic water control equipment. SACID is contributing to several ICID working groups and assisting in the preparations for the upcoming events.

Spanish National Committee (CERYD)

Mrs. Inmaculada Bravo Dominguez, Spanish Ministry of Agriculture (MAPAMA) serves on the Spanish National Committee on Irrigation and Drainage. CERYD actively contributes to the activities of the Commission.

Sri Lanka National Committee (SLNICID)

Er. K. D. Nihal Siriwardana was appointed as the new President of SLNICID. Er. Janaki Meegastenna, SLNICID Secretary actively contributed to the working group CLIMATE and, as SLNICID representative, was nominated for working groups CDTE and ASRWG. SLNICID actively contributed to organizing the 17th International Steering Meeting and Symposium of International Network for Water and Ecosystems in Paddy Fields (INWEPF) 2020/2021, held in Colombo, Sri Lanka, on 2-3 November 2021, where President, ICID Prof. Dr. Ragab Ragab made a presentation during the inaugural session, highlighted the similarities between the objectives of INWEPF and ICID and the ICID's recognition of the importance of rice. He also informed about the ongoing developments in rice culture, water-saving techniques, efficiency, and productivity improvements in rice cultivation.

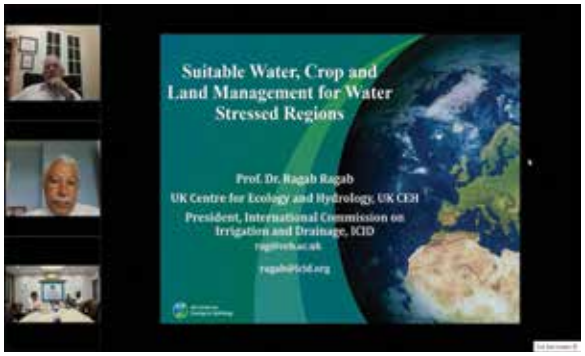
Thailand National Committee (THAICID)

Mr. Praphit Channa was appointed as the new President of THAICID. He currently serves as Director-General of the Royal Irrigation Department of the Ministry of Agriculture and Cooperatives. Mr. Chalearmkiat Kongvichienwat was appointed as the Secretary-General and Mr. Surachat Malasri as the new Deputy Secretary-General and Chairman of THAICID.

Tajikistan National Commission on Irrigation and Drainage (TajNCID)

The Hon'ble Ambassador of Tajikistan to India, Mr. Lukmon Bobokalonzoda visited the Central Office with his team in February 2022 to discuss the upcoming Dushanbe Water Process: The 2nd High-Level International Conference on International Decade for Action (Water for Sustainable Development). Secretary General Ashwin B. Pandya welcomed Mr. Bobokalonzoda and his team. The visitors had wide-ranging discussions with Secretary-General Er. Ashwin B. Pandya and other ICID officers. Mr. Bobokalonzoda expressed a keen interest in the activities of ICID. TajNCID is planning to organize the 14th International Drainage Workshop at Dushambe, September 2023

United Kingdom National Committee (IWF/ICID.UK)



ICID and IWF/ICID.UK have jointly conducted several activities, including webinars, visits, and agenda discussions on different platforms. These are briefly summarized here:

ICID, in collaboration with the UK-based Center for Hydrology & Ecology, organized a technical webinar on "Suitable Water, Crops and Land Management for Water Stressed Regions" on 17 June 2021 by inviting the subject matter experts, its members, partners, and stakeholders for stock-taking and knowledge-sharing. The speaker and moderator included Dr. Ragab Ragab, President ICID and Fellow of UK Center for Ecology & Hydrology, Dr. Franklin E. Dimick, Chairman of the Working Group on Managing Water Scarcity Under Conflicting Demands (WG-MWSCD), respectively. The webinar explored the deep root of water scarcity, freshwater availability per capita for one century, 1950 – 2050, the challenges facing water resources under possible future climate change, projected impacts of climate change, applications of hydrological models, water situations in arid and semi-arid regions, and rainwater harvesting using different techniques.

IWF/ICID.UK organized a webinar on "COSMOS, Scintillometer & Eddy Cov New Technologies to save Irrigation Water" on 23 June 2021. The participants included both the members and non-members of IWF. The Irrigation and Water Forum (IWF) is a professional network of practitioners, researchers, academics and students across many disciplines and themes to promote British expertise in the fields of water resources, irrigation, drainage, and flood management. It also provides a knowledge-sharing platform dedicated to issues that cover the entire spectrum of the sustainable water management practices required to achieve a water-secure world free of poverty and hunger through sustainable rural development. The Webinar discussed that the accurate estimation of irrigation water requirements could save water and minimize losses, allowing more land to be irrigated and subsequently more food to be produced.

ICID with the British National Committee of the International Commission on Irrigation and Drainage (IWF/ICID. UK), jointly organized a tea-time talk on the topic "Sustainable Irrigation Development: A Water-Energy-Food (WEF) Nexus Perspective Achieving More Crop Per Drop Per Joule Per Hectare Under Climate Change" on 15 March 2022.

President Prof. Dr. Ragab Ragab gave a presentation on "Agriculture Water Management Under Climate Change" at the Glasgow University, U.K, held on 28 October 2021, just ahead of COP26. Some of the key issues highlighted were: (a) There is a need to narrow the increasing gap between water supply and demand for global Food Security, (b) The Increasing frequency of flood and drought requires mitigation and adaptation for human and food security, and (c) Mitigating greenhouse gases in agriculture requires the use of renewable clean energy.

U.S National Committee (USCID)

Ms. Amber Weber was elected as the new Executive Vice President of USCID. She is succeeding VPH Mr. Larry D. Stephens, who has served USCID magnificently and supported ICID for almost four decades.

Ukraine National Committee (UACID)

The Ukraine National Committee (UACID) has been contributing to the work body WG-IDSST and also participating in the regional activities of the ERWG. To celebrate "International Water Day 2022," it organized a collaborative International Scientific Conference "Groundwater as a strategic resource for the economic development of the state." The Conference was devoted to the topics: water management, water security, irrigation and drainage, and flood protection. The Conference proceedings can be viewed/ downloaded at: http://mivg.iwpim.com.ua/index.php/mivg/mivg2022

Uzbekistan National Committee (UZNCID)

A webinar on "Work on the implementation of Water-Saving Technologies for Modern Agriculture and Digitalization of Water Resources Management in the Republic of Uzbekistan" was organized by the UzNCID in collaboration with ICID on 22 December 2021. The webinar started virtually with the opening speech presented by Mr. Shavkat Khamraev - Minister of Water Resources, Vice President, ICID, Er. Ashwin B. Pandya - Secretary-General, ICID, and Mr. Kurbanov Shamsiddin served as the moderator. The session reviewed the policy framework and adaptive technology proposed by the UzNCID to support water-saving in agriculture. It also highlighted the role of artificial intelligence in the water resources management of Uzbekistan.

Chinese Taipei Committee-ICID (CTCID)

The Chinese Taipei Committee (CTCID) is contributing to the work bodies WG-SDTA, WG-WATS, EB-JOUR, WG-SON-FARM, WG-IOA, TF-MTD, WG-IDM, WG-MWSCD, WG-CLIMATE, WG-M&R, WG-VE, WG-IDSST, WG-HIST, WG-CDTE, WGNCWRI, WG-ENV, and WG-LDRG, and also a part of the regional activities of the ASRWG.

DIRECT MEMBERS

Public and private institutions are making significant contributions toward developing nations and the world. As a result, both sectors are likely to play essential roles in growth and sustainable development. One of the foremost priorities is to encourage and facilitate this convergence to lead to shared responsibilities in development challenges. To improve public-private partnerships for sustainable development, the National Committees are encouraged to involve institutions in the field of irrigation, drainage, and flood management through the exchange of knowledge, and experiences, including experts from the public, and private sectors, particularly in the identification and promotion of best practices. The activities will help in evolving guidelines for best practices, studies, and innovative tools that can be used to attain the collective goal of achieving sustainable development.

In this regard, ICID has taken the initiative of offering direct membership to private companies, institutions, and individuals in the domain related to irrigation, drainage, flood management, and AWM. Professionals, individuals, and officers of government or institution(s) - government and non-government; and companies, effectively representing interests within the scope of the objects of the Commission can participate in ICID activities through Direct Membership (DM) to further the goal of the Commission in their countries or sovereign areas. For more information, https://icid-ciid.org/member/direct_member. Profiles and relevant activities of ICID Direct Members are presented below:

Central Board of Irrigation & Power (CBIP)

Central Board of Irrigation & Power, set up by the Government in 1927, is a premier institution committed to the accelerated development of Water Resources, Power, and Renewable Energy Sectors in the country. It has been rendering dedicated services to professional organizations, engineers, and individuals in the country and abroad for the last 90 years.

Presently over 260 organizations from Central & State Governments, Public Sector Units, and Private Sector are members of CBIP, besides over 3000 general body members at the rank equivalent to Chief Engineer and above. The Board functions as the Indian National Group/Chapter for international organizations like International Commission on Large Dams (ICOLD); International Society for Rock Mechanics (ISRM); International Tunnelling and Underground Space Association (ITA); International Water Resources Association (IWRA); World Water Council (WWC); International Geo-synthetics Society (IGS); International Council on Large Voltage Electric Systems (CIGRE); International Conference for Electricity Distribution (CIRED); Indian National Hydropower Association (INHA). Also, the International Association for Small Hydro (IASH), International Association on Electricity Generation, Transmission & Distribution (Afro-Asian Region) (AARO), and Society of Power Engineers function from the CBIP Office.

CBIP publishes Technical Literature and Journals, including manuals, guidelines, and technical specifications related to the fields of Power, Renewable Energy, and Water Resources sectors. To date, about 5000 technical publications have been brought out in addition to publishing monthly Water and Energy International Journal, which covers special features on the development and management of the activities in water resources, power, and renewable energy sectors. Indian Chapter of various International Societies having Secretariat in CBIP is also bringing out their half-yearly journals. CBIP is also providing free access to CBIP publications online to about 35000 officers of 240 Member organizations.

Electrosteel Group, India

The Electrosteel Group has established itself as an international brand that values commitment to excellence. With five decades of experience, Electrosteel Castings has fulfilled its vision of 'Carrying life to people, safe drinking water for all.' Being the country's leading pipeline solutions provider, Electrosteel has been providing clean drinking water to millions - a promise of quality that has led it to achieve international benchmarks and be recognized worldwide as a global leader that understands the priorities of customers across 35 countries.

Most recently, on behalf of the Group, Mr. Manoj Das, and Mr. Rajat Chowdhury attended the WIF3 and the 70th IEC Meeting of ICID at Bali, Indonesia, and participated in the 'International Workshop on Modernizing Irrigation Services for Water, Food, and Nutrition Security, and 'Historical Management of Water'. On this occasion, Mr. Rajat Chowdhury also presented a technical paper on 'A case study on the conversion of canal-based Irrigation Network System to Pressurized Pipe based Network System integrated with solar plant in the state of Uttar Pradesh, India' authored by Mr. Sabarna Roy, and co-authored by Mr. Rajat Chowdhury at International Workshop on Modernizing Irrigation Services for Water, Food, and Nutrition Security.

India Water Foundation (IWF)

On World Environment Day, the UN launched the decade on Ecosystem Restoration. India Water Foundation, President, Dr Arvind Kumar, was invited as a distinguished speaker by the Department of Agriculture and Environmental Science, National Institute of Food Technology Entrepreneurship and Management (NIFTEM). The event was organized by the Ministry of Food Processing Industries and NIFTEM. He presented a keynote presentation on the theme "ECOLOGICAL RESTORATION. India Water Foundation's e-poster represented India Water Foundation's mission and priority areas and how they are relevant today.

The chief functionary of India Water Foundation, Mrs. Shweta Tyagi was elected as a member of the Governing Council of UN Global Compact Network India, and she is committed to contributing to amplifying and integrating SDGs. India Water Foundation became a member of the South Asia Network for Sustainable Development (SANS), created by the UN-ESCAP to foster subregional cooperation to achieve SDGs in the South Asia Region. IWF's Jal Mitra campaign to turn 'Biodiversity Conservation into Public Movement' was shared by CBD as IWF's action commitment to take collective actions and safeguard, conserve and protect biological diversity. We signed a Memorandum of Understanding with the National Jal Jivan Mission of the Ministry of Jalshakti, Government of India for the implementation of the Jal Jivan Mission across the country. Dr. Kumar gave a keynote address at the Virtual 5th World Water Summit 2021 from 21st to 22nd August 2021.

To amplify our efforts in Sustainability, India Water Foundation has forged a new partnership with Global Alliance for a Sustainable Planet (GASP). A collaborative platform for transformation and mobilizing action. Dr Arvind Kumar spoke on SDG6 and its linkages with other sectors as a member of 'The Economic Times SDGs Water Leadership Council's first meeting. Dr. Arvind Kumar represented IWF at the IUCN World Conservation Congress in Marseille, France, and signed the declaration on "No water security without ecological security / No ecological security without water security."

He also had meeting with Indonesian Embassy's H.E. Mochammad Rizki Safary, Minister Counsellor and Mr. Haidi Nur Hashfi, Second Secretary Political Affairs for visiting IWF's office and having a comprehensive discussion on diverse agendas of mutual cooperation. Dr. Arvind Kumar made a vivid speech during the World Wetlands Day celebrations organized by NMCG and WWF. He also spoke on "Enabling Business in Agriculture via Ecosystem-based adaptation for sustainable food security" at the Seminar on "Sustainable Agriculture and India towards Total Food Security organized by World Food Trust. Dr. Kumar deliberated on life below water SDG14. The forum was followed by Policy Dialogue on Regional Cooperation for Sustainable Development in South Asia on 17 November.

As Governor of World Water Council, Dr. Arvind Kumar President India Water Foundation and Alternate Governor of World Water Council Shweta Tyagi, Chief Functionary India Water Foundation attended the 77th World Water Council Board of Governors meeting on 19-20 March at Dakar, Senegal and further attended the 9th World Water Forum. At the Forum they intervened in several high-level sessions and organized various panel discussions with participation from World Bank, FAO, UNEP, and World Water Council.

Institute of Soil Physics and Rural Water Management, Vienna, Austria

The Institute of Soil Physics and Rural Water Management (Sophy) is part of the University of Natural Resources and Life Sciences Vienna (BOKU). It focuses on the research of the water cycle, where water interacts with soil. The institute aims to

optimise the sustainable use of water and soil resources. Drought is an increasing problem for agriculture in Austria; therefore, irrigation becomes more and more meaningful. Efficient methods are implemented like electrification of field irrigation systems and drip irrigation for field crops. Water quality and Water quantity Investigations are topics in practice and research from the institute. Delegations from the Institute did scientific visits to Bulgaria, Mexico, Mongolia, and China in recent years to address several issues on water quality and irrigation management, as well as experiments on soil nutrients. For evapotranspiration and nutrient losses, the use of lysimeters was explained. The institute also covers several bachelor's and master's studies of the university, especially topics related to soil physics and hydraulics in the frame of rural water management, including field trips as part of the curriculum.

WAPCOS, India

WAPCOS Limited is a "MINI RATNA-I" Public Sector Enterprise under the aegis of the Ministry of Jal Shakti. Incorporated on June 26th, 1969 under the Companies Act, 1956; WAPCOS is a technology-driven Consultancy, and Engineering, Procurement, and Construction (EPC) organization with a strong home country, and global presence in the field of Water, Power, and Infrastructure sectors. WAPCOS has the requisite experience & expertise to undertake Consultancy & EPC projects of any scale, and complexity in the sectors of its operations. WAPCOS's portfolio of projects is both impressive and diverse. The quality management systems of WAPCOS comply with the Quality Assurance requirements of ISO 9001:2015 for Consultancy Services in Water Resources, Power, and Infrastructure Development Projects. Company's Vision is "A Global Leader in Consultancy, and Engineering, Procurement & Construction (EPC) providing Integrated & Customized Solutions for Sustainable Development of Water, Power, and Infrastructure Projects."

Main Fields of specialization of the Company cover Environment; Urban and Rural Areas development; Watershed Management; Water Supply, Sanitation, and Drainage; Irrigation, Drainage and Water Management; Ground Water Exploration and Minor Irrigation; Flood Control and River Morphology; Dams, and Reservoir Engineering; Water Bodies & Land Conservation; Agriculture; Non-conventional Sources of Energy; Hydropower; Transmission & Distribution; Rural Electrification; Pumped Storage Projects; Natural Resources Management; Thermal Power; Ports, Harbours, and Inland Waterways; Roads, and Highway Engineering; Buildings & Townships; Ropeways. The Company provides concept to commissioning services for developmental projects in India and Abroad.

WAPCOS is registered with various international funding agencies for participating in the funded projects like World Bank, Asian Development Bank, African Development Bank, United Nations Development Programme, European Bank for Reconstruction, and Development, Asian Infrastructure Investment Bank, United Nations Office for Project Services, United Nations Industrial Development Organization, kfW, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, New Development Bank, etc.

Apart from India, WAPCOS has completed/ongoing consultancy assignments in countries covering Asia, Africa, CIS, Eurasia, Europe, North America, Oceania, Pacific Islands, and South America.

WAPCOS has footprints in more than 50 Countries such as Angola, Afghanistan, Austria, Benin, Bhutan, Botswana, Burundi, Cambodia, Cameroon, Central African Republic, Chad, Czech Republic, DR Congo, Eswatini, Ethiopia, Fiji, Georgia, Ghana, Guinea Conakry, Indonesia, Jordan, Kenya, Lao PDR, Lesotho, Liberia, Madagascar, Malawi, Maldives, Mongolia, Mozambique, Myanmar, Nepal, Niger, Nigeria, Papua New Guinea, Poland, Rwanda, Senegal, Sierra Leone, Sri Lanka, Suriname, Tanzania, Tajikistan, Timor-Leste, Togo, Uganda, USA, Uzbekistan, Vietnam, Zambia, Zimbabwe.

The Company operates in all the States of India, spanning across Government, and Private Sectors, with the pride of having been involved in almost all the premier Government of India schemes like Atal Mission for Rejuvenation, and Urban Transformation (AMRUT), Namami Gange-Integrated Ganga Conservation Mission, Smart City, Deen Dayal Upadhyaya Gram Jyoti Yojana (DDUGJY), Pradhan Mantri Awas Yojana (PMAY), Integrated Power Development Scheme (IPDS), Pradhan Mantri Krishi Sinchayee Yojana (PMKSY), Pradhan Mantri Gram Sadak Yojana (PMGSY), Interlinking of Rivers, Skill India, Swachh Bharat Abhiyan, Swachh Vidyalaya Abhiyan, Make in India, etc.

WAPCOS actively participate in ICID workbodies. Mr. R.K. Agarwal, Chairman-cum-Managing Director is a member of WG-AFM and WG-IDSST.

Jain Irrigation, India

ICID, in collaboration with the National Water Academy of India and two international industry leaders, Jain Irrigation Systems Limited (JISL) and Netafim Irrigation Private Limited, organized an online certificate course on Micro-Irrigation Systems from October 2020 to April 2021. The faculty team included world-renowned micro-irrigation experts and field research specialists on drip and sprinkler systems adoption by farming communities. The concluding webinars for the course were conducted by JISL and Netafim Irrigation Private Limited. For the detailed webinar, please visit: < https://youtu.be/9xoP0mokE14 > . Dr. P. Soman, Chief Agronomist, JISL authored the publication "Fertigation - A novel Method of Applying Crop Nutrients." JISL actively participates in ICID workbodies, Dr. P. Soman (WG-WATS); Mr. M.S. Sudhakar (WG-Son-Farm); Mr. Dilip Yewalekar (WG-Son-Farm); Mr. Atin Kumar Tyagi (WG-Climate); Mr. Abijit Joshi (WG-WATS).

Rivulis Irrigation India Ltd.

Rivulis, in association with ICID and other partners, organized a webinar series on "Water Use Efficiency" on 20 January 2022. The webinar included expertise and professionals in the water-related sector. The webinar mainly covered the core issue of water distress, water management, water security, water demand, aqua-recharge, contaminations of water, and new innovations to reuse and fulfil the water requirement of a growing population in cities. ICID SG Ashwin Pandya served as a panellist in the webinar. Dr. Sangita Ladha actively participates in the technical activities of the Commission.

INTERNATIONAL COOPERATION

Water is perhaps the greatest unifier in the world in every sense of the word. It helped create human communities among the hunter-gatherer nomads by settling them on the banks of major rivers and other waterscapes. Eventually, these early communities transformed into ancient civilizations over thousands of years and then later into the nations and regions of the world. Water has been a catalyst for partnership development within communities, nations, and regions. It continues to serve as that even now in our globalized world, simply because it is a universal resource requiring cooperation to flourish the human population.

Since its inception, ICID has been giving utmost importance to the need to have joint activities and partnerships with i nternational organizations in the water and related sectors such on topics of mutual interest like Agricultural Water Management (AWM) through a signed Memorandum of Understandings (MoUs), Letter of Agreements (LoAs), etc. Thus, ICID has collaborative arrangements with African-Asian Rural Development Organization (AARDO), Arab Water Council (AWC), Asian Development Bank (ADB), Daugherty Water for Food Global Institute (DWFI), Commonwealth Scientific and Industrial Research Organization (CSIRO), International Center for Biosaline Agriculture (ICBA), International Crop Research Institute for the Semi-Arid Tropics (ICRISAT), International Center for Agricultural Research in the Dry Areas (ICARDA), International Commission on Large Dams (ICOLD), International Water Management Institute (IWMI), International Water Resources Association (IWRA), World Meteorological Organization (WMO), World Water Council (WWC) and World Bank among others.

Besides, ICID has consultative status with several UN bodies like UN Economic and Social Council (UN-ECOSOC), UN-Water, Food and Agriculture Organization (FAO), United Nations Educational, Scientific and Cultural Organization (UNESCO), World Health Organization (WHO), International Fund for Agricultural Development (IFAD), WMO and International Standards Organization (ISO). ICID's major technical partners are FAO, ADB, IWMI, UN-Water, WWC, World Bank, IWRA, DWFI, CSIRO, AARDO, IFAD, ICOLD, IsDB, IGS, and ICRISAT, who are actively involved in the organizational and technical aspects of ICID's WIFs, Congresses, Training Programs, World Water System Heritage Programme (WSH), International Research Programme for Irrigation and Drainage (IRPID), ICID Services and organizing webinars on topics that are of interest to the water resources community.

In the following paragraphs, a summary of the collaborative activities that have been undertaken by ICID during the financial year 2021-22 with key international and regional partners in fulfilling ICID's vision of 'A water-secure world, free of poverty and hunger through sustainable rural development is presented.

African-Asian Rural Development Organization (AARDO)

ICID has a standing MoU with AARDO, which is effective till 2025, indicating the areas of cooperation and forms of cooperation and other terms and conditions governing the collaborative activities. Recognizing that AARDO and ICID share mutual goals of poverty alleviation through food and water security, this MoU is instrumental in supporting each other's interventions to reduce risks due to water-related extremes – floods and droughts, and effective rural development in Asia and Africa, in particular. To achieve these goals, both AARDO and ICID have a mutual interest and commitment to work in the better management of water resources, especially in rural areas, using the latest tools and information. The MoU is intended to further enhance AARDO's ability to appropriately make use of the outreach, capabilities, and expertise of ICID in the areas of agricultural water management for beneficial use of AARDO's sustainable agriculture and rural development efforts, and it defines the general areas of cooperation and the scope and nature of collaboration. The MoU encourages close cooperation, collaboration on projects, and activities of mutual interest. Activities like information sharing, joint research tasks, consultations, and technical support services in 'Water', 'Agriculture', and 'Rural Development' will be promoted.

AARDO was one of the sponsors of the international training program, which was held on the theme "Micro-irrigation systems to reduce the impact of climate change" from 19-23 November 2021 for the benefit of young African water professionals. Forty-three participants from 14 countries, viz. South Africa, Nigeria, Burkina Faso, Senegal, Zambia, Benin, Soudan, Egypt, Kenya, Ethiopia, Tunisia, Mali, Djibouti, and Morocco attended the YP training program.

As part of the collaborative arrangements with AARDO, Secretary-General ICID attended the 77th Session of Liaison Committee of AARDO held at AARDO headquarters on 07 October 2021 as an observer. On 25 February 2022, ICID Secretary-General, accompanied by the Executive Director and Director (Technical), held discussions with the Secretary-General, AARDO, about a series of round talks, including the vision of ICID and AARDO in the framework of the food, energy, hunger, agriculture and how to uplift the standard of living and sustain the SDG's by 2030. Secretary-General Er. Pandya presented a copy of the "ICID Coffee Table Book" to Dr. Manoj Nardeosingh, Secretary-General AARDO, and apprised him about the ongoing activities and upcoming events of ICID, such as the 24th ICID Congress and 73rd IEC Meeting of ICID, Adelaide, South Australia, and the 4th World Irrigation Forum, Beijing, China. AARDO Secretary-General expressed his keen interest in the activities of ICID and appreciated ICID's role in promoting global collaboration in irrigation and drainage to achieve a water-secure world free of poverty and hunger.

Besides, ICID Staff Members attended AARDO training programs and webinars, which were found to be quite useful in enhancing their knowledge and efficiency through innovative technologies and management tools.

Arab Water Council (AWC)

AWC was launched on 14 April 2004 as a regional nonprofit organization with activities extended on both regional and international scales. The Headquarters of the Arab Water Council is the Arab Republic of Egypt. AWC is working towards an Arab collective role that raises the level of awareness of existing water resources management challenges, intensifies the current effort to confront them, and contributes to the development of the new water culture. There is a significant similarity in the visions of both ICID and AWC, which is conducive to working on a mutually beneficial agenda of better management of water resources.

As part of its efforts toward expanding horizons in the Arab world, ICID signed a Memorandum of Understanding (MoU) with the Arab Water Council (AWC) during the 5th Arab Water Forum in Dubai from 21-22 September 2021. The objective of this MoU is to formalize a nonexclusive framework of cooperation and facilitate collaboration between the Parties to promote knowledge-sharing programs and projects that foster cooperation between them, including the possibility of co-financing projects related to capacity development activities and technical support, among others in their common member countries

ICID was a partner organization in the 5th Arab Water Forum held on 21-23 September 2021 in Abu Dhabi under the patronage of the United Arab Emirates' Ministry of Energy & Infrastructure and supported by the League of Arab States (LAS) and the Ministry of Water Resources and Irrigation of Egypt (MWRI). Providing a unique platform for communication, the 5th AWF is considered the stage where Arab water community leaders and key decision-makers thoroughly discuss water challenges that the Arab region is facing, being one of the most water-scarce regions in the world. The Forum also represents an important milestone in the run-up to the World Water Forum (WWF) and a meeting point for stakeholders who wish to be involved in the Arab regional process to reflect the voice of the Arab region in the WWF, promoting priority areas for development in key water-related sectors and mobilizing key actions towards achieving water security for the Arab region.

During 5th AWF, ICID organized three joint sessions in collaboration with its international partners such as FAO, ICARDA, IWMI and ICBA on topics such as "Leveraging the untapped potential of food production under water scarcity and climate change in the Arab region"; "Impact of Research, Technology, and Innovations on Water Productivity" and "Advanced Technologies and Early Warning Systems to improve agricultural water productivity in trans-boundary water basins" respectively. ICID Office Bearers and WB Chairs contributed through virtual and onsite participation as chairs, co-chairs, and presenters during AWF.

Asian Development Bank (ADB)

ADB is a technical partner of ICID in the organization of ICID's World Irrigation Forum, being part of the International Technical Advisory Committee (ITAC) constituted for overseeing the organizational and technical aspects of WIF. ICID also participates and contributes to the successful organization of the Asian Irrigation Forum (AIF), which was the precursor to ICID's WIFs. Besides, ADB regularly contributes to ICID's yearly activities, ranging from Webinars, Conferences, Publications and stakeholders' meetings.

ICID and ADB have decided to formalize these collaborative arrangements through a Memorandum of Understanding (MoU) signed by both the parties, following the decision of the 71st International Executive Council (IEC) meeting of ICID held virtually on 7-8 December 2020, that the international partners of ICID such as ADB may be treated differently and keeping in view of their contribution to ICID activities and long-term commitment. MoU will cover the scope of work, participation in ICID activities etc., rather than enrolling the Bank as an Institutional Direct Member.

Commonwealth Scientific and Industrial Research Organization (CSIRO)

The objective of CSIRO is to improve the livelihoods and economic well-being of people in large and complex river basins in Australia, Asia, the Pacific and South America, identify key challenges and opportunities for water use, planning and management and provide access to water in highly variable and changing climates, considering the needs of the environment and people. ICID entered into a Letter of Intent (LoI) signed in October 2017 for a period of five years in order to further scientific cooperation to encourage joint research and development activities, including development of the Basin Futures (BF), a web-based capacity development and planning tool (developed by CSIRO) that helps create various development scenarios in a river basin, particularly in scarce data situations.

ICID invited CSIRO for interactive sessions on topics such as 'Basin Futures' during ICID annual meetings for the benefit of the participants. CSIRO made a presentation on Basin Futures titled "Water resource scenario planning with an easy to use, cloud-based model" during the PCTA meeting of ICID held on 09 December 2021. The presentation was followed by a brief question-answer interactive session and members found the presentation highly useful.

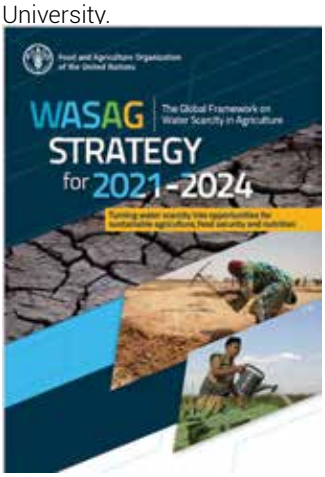
Daugherty Water for Food Global Institute (DWFI)

DWFI at the University of Nebraska addresses the global challenge of achieving food security with less stress on water resources through water management in agricultural and food systems. ICID and DWFI have been collaborating on issues of common interest, and DWFI is one of the strategic partners of ICID. DWFI served several times on the Jury for selecting the winner of ICID's prestigious World Irrigation and Drainage (WID) Prize and contributed to the successful organization of triennial WIFs and Congresses of ICID. Currently, Prof. Peter McCornick, Executive Director, DWFI represents the DWFI at the ITAC for WIF4 in Beijing, China, in 2023. In addition, ICID and DWFI join hands during World Water Forums to organize sessions on topics of interest to both the organizations like Food Security and Water-Energy-Food Nexus, among others.

Food and Agriculture Organization (FAO)

FAO is a specialized agency of the United Nations that leads international efforts to defeat hunger and improve nutrition and food security. ICID and FAO have been partnering for decades to promote sustainable AWM and achieve food security worldwide. FAO is a technical partner in ICID Congresses and WIFs and is part of ITACs for WIF and Congress. Besides, FAO is a member organization in the Task Force to Guide the Partnership Process (TF-GPP) reconstituted to provide support to the High-Level Advisory Group on "Partnerships for Agriculture Water Management". FAO experts participate in ICID's technical workbodies, including the Advisory Committee for International Programme for Research in Irrigation and Drainage (AC-IRPID). VPH Dr. Marco Arcieri, Secretary-General, ITAL-ICID is designated as ICID's Permanent Observer to FAO meetings, including Council meetings held in Rome.

ICID is a partner in FAO's initiative on Global Framework on Water Scarcity in Agriculture (WASAG) and currently chairing the International Steering Committee (ISC) of WASAG is chaired by immediate past President Er. Felix B. Reinders, President Hon. ICID, Prof. Dr. Chandra Madramootoo is also a member of ISC representing McGill University.



Since WASAG plans to build partnerships between water stakeholders at the national level, among countries and key international bodies involved in agricultural water management, ICID has established a High-Level Advisory Group (HLAG) on 'Partnerships for Agriculture Water Management' as an action-oriented multi-stakeholder partnership to facilitate improving agricultural water productivity, especially in irrigated areas where the competition for water is intensifying and/or water supplies are becoming less reliable. The two initiatives can be complimentary, and ICID as a partner in WASAG has made efforts to bring synergy between the two initiatives. VPH Dr. Marco Arcieri is the Focal Point for Working Group on 'Sustainable Use of Water Resources' of WASAG representing ICID. ICID is also a member of WASAG WGs on 'Sustainable Agriculture Water Use' and 'Communication Strategy.' WASAG has been hosting a series of webinars, and ICID Office Bearers are participating in these webinars as speakers and contributors. ICID contributed in the development of the FAO-UN WASAG STRATEGY for 2021-2024. For more, please visit: http://www.fao.org/3/cb5448en/cb5448en.pdf.

In partnership with ANAFIDE, the Moroccan NC of ICID, FAO, through its regional office in Cairo, organized in November 2021 a side event on the theme "Water Energy Agriculture Nexus." The World Bank also participated in an intervention entitled "Governance and technology for a resilient and sustainable water agriculture nexus.

ICID and FAO organized a webinar on 'Updates and Advances to the FAO56 Crop Water Requirements Methods'

on 15 February 2022. FAO56 – "Crop Evapotranspiration. Guidelines to Compute Crop Water Requirements," published in 1998 and quoted in nearly 35,000 studies, proposed to the irrigation and academic world a comprehensive methodology for computing crop water and irrigation requirements. The objective of the Webinar was to bring the updates and enhancements, which are expected to improve and expand the application of FAO56 methodologies by a range of users and, in general, by researchers in the domains of land and water management given the development of science and technology since its publication in 1998. The webinar was moderated by ICID President Dr. Ragab Ragab, and panelists included VPH Prof. Em. Dr. Luis Santos Pereira, Dr. Richard G. Allen, Dr. Paula Paredes, Dr. Ramón López-Urrea and Prof. Nebo Jovanovic.

Global Water Partnership (GWP)

GWP is a global action network with over 3,000 partner organisations in 179 countries. The network has 68 accredited Country Water Partnerships and 13 Regional Water Partnerships. The network includes all the organizations involved in water resources management: developed and developing country government institutions, agencies of the United Nations, bilateral and multilateral development banks, professional associations, research institutions, non-governmental organisations, and the private sector. GWP is a partner organization of ICID's WIFs and a member of ITAC for WIF4. GWP is a permanent observer in PCSO. Following a coordinated action mechanism with fellow development partners, GWP and ICID encourage regional and country water partnerships to collaborate with ICID's NCs wherever possible, creating a stronger GWP-ICID technical collaboration. It includes potential joint initiatives for floods, droughts, and climate services. GWP agreed to engage with ICID on relevant drought and flood management activities.

ICID also collaborates with GWP in the Integrated Drought Management Programme (IDMP), being coordinated by WMO and attends GWP's annual network meetings. The GWP India Strategy 2020-2025 was launched by ICID Secretary-General Er. Ashwin Pandya as the Chair of the panel discussions. GWP collaborates with ICID in the nomination process for Water ChangeMaker Awards and in the identification of the most deserving Awardees.

International Association for Agricultural Sustainability (IAAS)

IAAS is an international platform for academicians, researchers, industry players, and policymakers in the fields of agro-technology, sustainability, food technology, innovation, management, and economics to communicate and interact for the advancement of research, instruction, trade promotion, and policy development. The main focuses of IAAS are innovation, sustainability, technology, and investment. They have been campaigning successfully for the past years to work as an international platform for knowledge and techniques transformation in the agricultural industry.

IAAS expressed their desire to have collaborative arrangements with ICID and Secretary-General Er. Ashwin Pandya was a panellist at the webinar on "Sustainable Water Management in Agriculture" organized by IAAS on 25 March 2022 on an invitation from them.

IAAS indicated their wish to participate and contribute to the 10th International Micro Irrigation Conference at Dakhla, Morocco, from 25-27 January 2023, as their membership mainly consists of manufacturers of micro-irrigation components and participate largely in an exhibition during the 10th IMIC. ICID will soon be entering into an MoU with them to formalize the collaborative arrangements with them.

International Commission on Large Dams (ICOLD)

ICOLD is an international non-governmental organization dedicated to the sharing of professional information and knowledge of the design, construction, maintenance, and impact of large dams. It was founded in 1928 and has its central office in Paris, France, with country offices around the world, including New Delhi, India. It consists of 100-member national committees which have a total membership of about 10,000 individuals. ICID and ICOLD have been jointly taking up many issues in the global water sector for decades, including the WSH Programme, a joint initiative with WWC. ICOLD's consistent involvement and active participation in the WIFs represent their support and the years-old partnership with ICID.

ICOLD is a leader in setting standards and guidelines to ensure that dams are built and operated safely, efficiently and economically and are environmentally sustainable and socially equitable. Every year, ICOLD holds an Annual Meeting and Symposium in a selected country. An important part of the annual ICOLD event is the opportunity for all delegates to observe the meetings and workshops of the Technical Committees and interact with experts from other countries. ICID significantly contributed to the successful organization of the 88th Annual Meeting of ICOLD and Symposium on "Sustainable Development of Dams and River Basins" with ICID Secretary-General Er. Pandya served as the Member and Chairman of the Technical Committee.

ICID and ICOLD have agreed to continue to exchange their professional knowledge in each other's fora and thus contribute to the roundtable discussion that will close ICOLD Symposium to be held on 30 May 2022, during the 27th ICOLD Congress in Marseille, France, from 27 May to 03 June 2022. President Prof. Dr. Ragab will represent ICID at the roundtable and sign an MoU with his counterpart in ICOLD in a separate ceremony.

International Council on Monuments and Sites (ICOMOS)

ICOMOS, an international network of experts works for the conservation and protection of cultural heritage places. It is the only global non-government organization of this kind, which is dedicated to promoting the application of theory, methodology, and scientific techniques to the conservation of architectural and archaeological heritage. ICOMOS contributes to improving the preservation of heritage, the standards and the techniques for each type of cultural heritage property: buildings, historic cities, cultural landscapes and archaeological sites. ICID and ICOMOS have collaborated for many webinars, activities and events in the past. The two organizations worked closely on the cause of rainwater harvesting.

ICOMOS actively supports ICID's heritage programs, such as World Heritage Irrigation Structures (WHIS) and the World Water Systems Heritage (WSH). Moving ahead, ICID was part of ICOMOS webinar series on "Cultural Heritage Solutions for Water Challenges". The specific objective of the webinar was to inform the participants about the objectives and activities on water-related cultural heritage by international water organizations, including WSH programme of ICID, the Specialist Group for Water and Wastewater in Ancient Civilizations.

International Center for Biosaline Agriculture (ICBA)

ICBA, with a vision for sustainable livelihoods and food security in marginal environments, is on a mission to work in partnership to deliver agricultural and water scarcity solutions in marginal environments. It is strategically engaged in promoting sustainable management of natural resources, providing climate change solutions, and enhancing agricultural value chains to advance sustainable food, feed, and biofuel agri-technologies. ICID in collaboration with ICBA and ICARDA organized a cross-cutting session on "Advanced Technologies and Early Warning Systems to Improve Agricultural Water Productivity in Trans-boundary Water Basins" during the 5th AWF in September 2021.

ICID and ICBA feel the future potential for mutual growth through cooperation and synergetic activities. Accordingly, an MoU was signed between ICBA and ICID

at ICBA Headquarters in Dubai. The objective of the MoU is to recognize each other's unique authority, capabilities, and memberships through consideration of mutual interests and respecting the objectives and responsibilities as set forth in their respective constitutional instruments, and memorialising their understanding regarding certain joint activities in which they plan to engage.

International Crop Research Institute for the Semi-Arid Tropics (ICRISAT)

ICRISAT is an international organization that conducts agricultural research for rural development, headquartered in Patancheru, India, with several regional centers and research stations. ICID and ICRISAT have worked together over many years towards the cause of agricultural water management and food security.

ICID and ICRISAT have worked together over many years towards the cause of agricultural water management and food security. ICRISAT is a technical partner in the organization of ICID's WIFs and is currently represented in the ITAC for WIF4. Professionals from ICID member countries and associate member countries benefit from international training programs organized by ICRISAT.

International Center for Agricultural Research in the Dry Areas (ICARDA)

ICARDA works in severely resource-stressed areas that face serious water scarcity, climate variability, severe environmental degradation, extreme temperatures, and drought. ICARDA implements proven agricultural technologies and climate-smart water irrigation techniques to improve on-farm water use and efficiency for higher water and land productivity. ICARDA's integrated innovations include maximizing in-situ water through conservation interventions, fine-tuning when and how to irrigate to produce "more yield per drop," water-harvesting and water-conservation techniques in rainfed agriculture, and exploring the safe use of treated wastewater to produce more feed, forage, and trees.

ICID and ICARDA signed a memorandum of understanding to put in place a formal framework for future collaboration between ICARDA and ICID in November 2021. The framework aims to build on the expertise and innovation of the two organizations in water management and efficiency while promoting knowledge sharing, collaborative programs, projects, and capacity development activities. The agreement will also build on longstanding relationships with key stakeholders on joint activities such as participation in the 5th Arab Water Forum.

The MoU will also draw on each organization's past success in resource mobilization and technical assistance opportunities, as well as push for regional capacity development, education, and training through joint seminars, training, webinars, and workshops. ICARDA will also be invited as an observer to the ICID Executive Council/ International Executive Council, ICID Congress/World Irrigation Forums whenever appropriate.

International Fund for Agricultural Development (IFAD)

IFAD is an international financial institution and a specialized agency of the United Nations that works to address poverty and hunger in the rural areas of developing countries. IFAD has been a partner in ICID's World Irrigation Forum event since its inception in 2013 and has contributed to the successful organization of WIFs held so far. IFAD and ICID have an arrangement of deputing their representatives to each other's Council meetings as Observers.

VPH Dr. Marco Arcieri, Secretary-General, ITAL-ICID is designated as ICID's focal point for IFAD meetings in Rome. ICID was represented at the forty-third session of IFAD, which focused on the theme of sustainable food systems to end hunger. ICID and IFAD are also partners in WASAG, an FAO-led initiative. Mr. Mawira Chitima acts as the focal point for IFAD and represents IFAD at the International Technical Advisory Committee (ITAC) for WIF4 in Beijing, China.

International Food Policy Research Institute (IFPRI)

IFPRI is an international agricultural research centre founded in the early 1970s to improve the understanding of national agricultural and food policies to promote the adoption of innovations in agricultural technology. ICID has been collaborating with IFPRI on matters of mutual interest either bilaterally or through its NCs. IFPRI has been participating in ICID's WIFs by way of organizing side events related to the theme of the Forum. ICID, as one of the partners of WASAG has been contributing as a co-lead in the Working Group (WG) 'Transitions to Sustainable Agriculture Water Use' led by IFPRI.

International Geosynthetics Society (IGS)

IGS is a learned society dedicated to the scientific and engineering development of geotextiles, geomembranes, related products, and associated technologies. There is a standing MoU between ICID and IGS signed in October 2011 to liaise each other for improvements in the art and techniques of irrigation, drainage management, geosynthetics and to periodically review and evolve progressive strategies in the outlined areas of cooperation. Based on the MoU, IGS has been partnering in ICID's Congresses and WIFs by way of organizing sessions on topics of interest to both organizations.

A workshop on the use of geosynthetics as a coating for irrigation canals and water storage structures, in partnership with the International Association of Geotextiles was organized on November 2021 at Marrakech, Morocco during the 72nd IEC Meeting in 2021. It was aimed at modernizing irrigation schemes and hydraulic structures in order to save irrigation water through the reduction of seepage. IGS, with support of ICID, organized a virtual webinar series from 15-17 November 2021 on "Improving the Performance of Canals with Geosynthetics" with the objective of introducing the engineering community to the use of geosynthetics in canal design and restoration.

International Water Association (IWA)

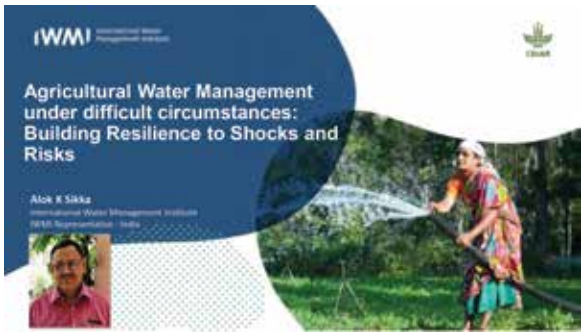
IWA is a non-profit organization and knowledge hub for the water sector, with over 60 years of experience connecting water professionals worldwide to find solutions to the world's water challenges. ICID has a standing MoU with IWA, which aims at establishing a wastewater reuse network, particularly for the safe reuse of water in the agriculture sector and urban purposes. The area of cooperation between both the organizations includes (i) Sharing of Latest Technologies in Water Management and Wastewater Treatment, (ii) Holding Workshops and Conferences, (iii) Implementation of Research Projects, (iv) Preparation of Guidelines and Standards; (v) Conducting Training and Educational Courses, (vi) Bringing out joint Publications, and (vii) Establishing Study Tours. The MoU is initially being implemented through NCs of ICID and IWA in Iran.

International Water Management Institute (IWMI)

IWMI is a non-profit research organisation with headquarters in Colombo, Sri Lanka, and offices across Africa and Asia. Research at the Institute focuses on improving how water and land resources are managed to underpin food security and reduce poverty while safeguarding vital ecological processes. ICID and IWMI have been collaborating on issues of common interest and IWMI contributed as one of the major technical partners of ICID in its annual meetings and flagship events -- WIFs and Congresses. IWMI is a Permanent Observer in ICID's PCTA, besides contributing to the work of several technical working groups. IWMI actively participates in the ITACs for 24th ICID Congress and WIF4. IWMI is a member organization in the Task Force to Guide the Partnership Process (TF-GPP) reconstituted to provide support to the High-Level Advisory Group on "Partnerships for Agriculture Water Management". IWMI is a partner in ICID's

research programme in irrigation and drainage – IRPID and a member of IRPID Advisory Committee. IWMI is also part of many joint initiatives like WASAG and Water Accounting alongside ICID.

ICID and IWMI held a session on "Impact of Research, Technology and Innovations on Water Productivity" during the sideline event of the 5th AWF in Dubai. The session discussed the role of innovation, tools and technology in assessing and improving water productivity with a special focus on the MENA region. Four case studies were presented from Jordan, Egypt, India and China, looking at different tools and practices to improve water management and productivity.



Dr. Alok Sikka, the country representative of IWMI in India, made a presentation on the topic "Agricultural Water Management: Building Resilience to Respond to Shocks and Risks" during the ICID Foundation Day held on 24 June 2021. He covered various case studies from India, Sri Lanka, Myanmar, and Afghanistan on how water availability and management were affected by COVID-19 pandemic in these countries. He concluded that as of now COVID19 had negligible influence on water use in agriculture and there is a very strong case for higher investments in agricultural water management to mitigate adverse future impacts.

IWMI joins in the organization of various sessions at World Water Forums and Stockholm International Water Weeks, besides organizing webinars, seminars, etc. VPH Chaiwat Prechawit (Thailand) represented ICID and made a presentation on the topic "Fish-friendly irrigation system in Thailand: a case study on Bang Rakam low land model" during Fish-friendly Irrigation Session with IWMI at SWWW on 24 August 2021. Prof. Dr. Ragab Ragab, President, ICID, virtually participated in the dialogue activities and Working Group discussions as part of the First Regional Science-Policy Dialogue on Water Reuse in the MENA Region, jointly organized by IWMI-MENA Regional Office and AWC.

International Water Resources Association (IWRA)

IWRA is a non-profit and non-governmental organization to improve the management of water resources. ICID and IWRA signed an MoU in June 2017, agreeing to collaborate to develop strategies for ensuring water and food security, duly recognizing the importance of water-energy-food nexus. The areas of cooperation included (i) Understanding the linkages between water-energy-food nexus and how this approach supplements IWRM approach; (ii) Developing decision-making tools that help recognize the existence of this nexus; (iii) Identifying the critical policy issues that need to be flagged; (iv) Identifying the areas of research to benefit from the existence of the nexus; and (v) Disseminating the benefits of the nexus approach. IWRA partners with ICID in the successful organization of 24th ICID Congress in 2022 and WIF4 in 2023. IWRA is also a permanent observer in ICID's Working Group on Irrigation and Drainage in the States under Socio-Economic Transformation (WG-IDSST).

ICID-IWRA jointly organized a virtual meeting to explore the possibility of a virtual conference focused on Global Water-Health and Food security by bringing together a diverse group of panellists. ICID-IWRA held joint consultations towards the organization of IWRA-ICID meeting on Water, Health and Food Security to be organized as part of IWRA's Online Conference on "Water, Food and Public Health in a Changing World". PH Prof. Chandra Madramootoo and VP Prof. Tsughiro Watanabe were members of the Joint Scientific Committee. The meeting overviewed the considerable research of the identified panellists on the benefits and potential barriers to widespread water reuse, which will be essential to meet the growing demands for freshwater and food security in the future. Climate change, industrial water demands, and population growth are all having effects on Water-Health and Food Security.

Since 1973, IWRA has held a World Water Congress every three years in various locations around the world. The objective of the World Water Congress is to provide a meeting place to share experiences, promote discussion, and to present new knowledge, research results and new developments in the field of water sciences around the world. For almost four decades, the World Water Congresses have been excellent events for the identification of major

global themes concerning the water agenda, and for the bringing together of a large cross-section of stakeholders for the development and implementation of decisions in the field of water. ICID was effectively represented at the 17th IWRA World Water Congress, held on 29 November - 3 December 2021, Daegu, Republic of Korea.

ICID stakeholders attended and contributed to the IWRA Webinars on the topics of "Source to Sea Management" and "The Role of the SDGs & WASH Initiatives in a Water Scarce World". IWRA is a technical partner in ICID's 24th Congress and will organize a couple of joint sessions and is represented in ITAC for 24th ICID Congress through one of their senior Vice Presidents.

Islamic Development Bank (IsDB)

IsDB has been collaborating with ICID in the areas of mutual interest by supporting as a partner organization in the conduct of the Young Professionals training program for the African Young Water Professionals Forum (Af-YWPF) from 25-27 October 2021 in cooperation with the African Regional Working Group (AFRWG) of ICID with the support of Ministry of Water Resources and Irrigation (Egypt), United Nations Economic and Social Commission for Western Asia (ESCWA), Arab Center for the Study of Arid and Drylands (ACSAD) of the League of Arab States, and Global Water Partnership-Mediterranean (GWP-MED)/ GWP Africa Coordination Unit during Cairo Water Week 2021 at Cairo, Egypt. More than 150 young professionals from 31 African countries, 101 Males and 52 Females, and the Mashreq countries participated and benefitted from the training.

Currently, both ICID and IsDB are exploring the possibility of entering into a Memorandum of Understanding (MoU) for collaborating in the areas of mutual interest such as integrated water resources management (IWRM), effective environment for sustaining water resources, delivering irrigation advisory services, empowering young professionals to contribute with innovative skills for the development of the water sector through training programs.

McGill University

The Department of Bioresource Engineering is part of the Faculty of Agricultural and Environmental Sciences of McGill University. It collaborates with other departments and the Faculty of Engineering in providing courses of instruction for a curriculum in Bioresource Engineering. PH Prof. Chandra Madramootoo is a distinguished James McGill Professor..

President Prof. Dr. Ragab Ragab attended the symposium on "International Symposium Mitigating Agricultural Greenhouses Gases and Increase Carbon Sequestration in a Circular Economy" hosted by the alliance of McGill University and Agriculture & Agrifood Canada on 29 September 2021. President Dr. Ragab familiarized the participants with ICID, including its goal, vision, mission, and how it helps the partner nations achieve their Sustainable Development Goals in a given time frame.

World Health Organization (WHO)

The World Health Organization is a specialized agency of the United Nations responsible for international public health. The WHO Constitution, which establishes the agency's governing structure and principles, states its main objective as "the attainment by all peoples of the highest possible level of health."

WHO recently released a report entitled "Progress on drinking water, sanitation, and hygiene in schools: Special focus on COVID-19." The report provides updated estimates for drinking water, sanitation, and hygiene in schools, including progress from 2015 to 2019. It highlights the rapid improvement needed to ensure students have access to handwashing facilities with soap and water during the COVID-19 pandemic and to meet associated SDG targets by 2030. ICID has consultative status with WHO spanning over decades.

The World Bank (WB)

The World Bank is an international financial institution that provides loans and grants to the governments of poorer countries to pursue capital projects. It comprises two institutions: International Bank for Reconstruction and Development and International Development Association. World Bank has been partnering in ICID Congresses and World Irrigation Forums and is represented effectively in its International Technical Advisory Committees. World Bank supports ICID's International Research Programme on Irrigation and Drainage (IRPID), as a member of AC-IRPID. World Bank is a Permanent Observer in ICID's permanent committees and a member in HLAG on Partnership Process. World Bank is actively involved in activities of the 24th ICID Congress and WIF4 as a member of the International Technical Advisory Committees for the respective events by leading the team in the preparation of a background paper for one of the sub-themes and other activities. Over the years, World Bank and ICID have jointly organized many events, meetings, conferences, webinars, and training programs.

International Network of Service Providers for Irrigation Excellence (INSPIRE), a joint initiative of ICID and the World Bank with support from organizations such as IWMI, FAO, ADB, and GWP, aims to provide a platform for knowledge exchange on irrigation and drainage service delivery among managers of I&D systems. INSPIRE is proposed to become the global thought leader in I&D service delivery. Now the INSPIRE has been established as a Task Force under ICID Strategy Theme – Scheme, and its meetings to take place as a half-or one-day side event of regular ICID Congresses and WIFs, to start with during the upcoming 24th ICID Congress to be held at Adelaide, Australia in October 2022.

A webinar on mapping and monitoring irrigation performance in the irrigation and drainage (I&D) sector was organized by INSPIRE on 27 January 2022 in collaboration with World Bank, ICID, IWMI, FAO, and GWSP. This webinar focused on using advanced innovative technologies for conducting performance assessments in the I&D sector and presented examples of a systematic way of measuring key performance indicators.

IHE Institute for Water Education

IHE Delft Institute for Water Education, formerly known as UNESCO-IHE Institute for Water Education is the largest international graduate water education facility in the world and is based in Delft, Netherlands. UNESCO-IHE and ICID have been collaborating to derive specialized educational solutions from the UNESCO-IHE experts to address the needs of diverse clients from the professional water arena represented by ICID. ICID-UNESCO-IHE collaboration has significant value to ICID's young irrigation professionals.

UNESCO-IHE offers many online training programs to young irrigation professionals and several ICID Office Bearers are faculty members and alumnae of UNESCO-IHE.

United Nations (UN) Water

UN-Water is an interagency mechanism that coordinates the efforts of United Nations entities and international organizations working on water and sanitation issues. ICID, being an UN-Water partner, actively promoted the observation of UN-declared days (World Water Day, World Environment Day and others) and promoted all the NCs to commemorate the events. ICID partners with the UNCCD in WASAG.

ICID is a partner organization in the UN-Water Decade Programme on Capacity Development (UNWDPC), a multi-year project under UN-Water, with other partners being FAO, WHO, United Nations Environment Programme (UNEP), United Nations University Institute for Water, Environment and Health (UNU-INWEH) and IWMI to promote safe practices in the usage of wastewater in agriculture with a robust policy and institutional framework in developing countries and countries in transition, focusing on multi-disciplinary and trans-ministerial approaches.

UN Decade on Ecosystem Restoration (2021-2030) is another UN activity in which ICID is partnering with various UN agencies. Ecosystem restoration aims to reverse the degradation of ecosystems, such as landscapes, lakes, and oceans to regain their ecological functionality; in other words, to improve the productivity and capacity of

ecosystems to meet the needs of society in the present and in the future. The UN Decade on Ecosystem Restoration stresses that ecosystem restoration and conservation contribute to the implementation of the 2030 Agenda for Sustainable Development, as well as other UN-related endeavors, such as the Paris Agreement on climate change.

The UN Food Systems Summit, held during the UN General Assembly in New York on 23 September 2021, set the stage for global food systems transformation to achieve the Sustainable Development Goals by 2030. UN-Water and its partner institutions held the Global Food Systems Summit Dialogue and identified water as a game-changer for food security, with irrigated agriculture being comparatively more productive than rain-fed food production.

In response to a request from UN Water in April 2021, ICID invited national water leaders from the ICID family to participate in a confidential survey towards the launch of the first Global Water Policy Report. The purpose of the report is to gain a better understanding of the real issues facing national water leaders to improve water outcomes at the national level. The report will increase the relevance of multilateral water processes and ensure they are better directed to support countries striving to achieve their water policy goals.

UNESCO

UNESCO is a specialized agency of the United Nations aimed at contributing to the building of peace, the eradication of poverty, sustainable development and intercultural dialogue through education, the sciences, culture, communication and information. As an international network of the water fraternity, ICID co-organizes and hosts many events, activities and conferences with UNESCO. Over the years, the collaborations have been strengthened with the dignitaries attending and participating in each other's events.

ICID participated in the Global Conclave on Water Security, a Water Digest magazine event with support from UNESCO. Water Digest is a premier water magazine that brings the latest technologies and varied opportunities to cope with the escalating water crisis in India and the rest of the world. Started in 2006, Water Digest is a global platform for all water-related issues. It promotes and builds awareness of critical water issues and triggers actions to facilitate the efficient management and use of water in all its dimensions on an environmentally sustainable basis.

World Meteorological Organization (WMO)

World Meteorological Organisation (WMO) is an intergovernmental organization with a membership of 193 Member States and Territories. It originated from the International Meteorological Organization (IMO), the roots planted at the 1873 Vienna International Meteorological Congress. Established by the ratification of the WMO Convention on 23 March 1950, WMO became the specialized agency of the United Nations for meteorology (weather and climate), operational hydrology, and related geophysical sciences a year later. The Secretariat, headquartered in Geneva, is headed by the Secretary-General. Its supreme body is the World Meteorological Congress. WMO provides world leadership, expertise, and international cooperation in weather, climate, hydrology and water resources, and related environmental issues and thereby contributes to the safety and well-being of people throughout the world and to the economic benefit of all nations. It facilitates the free and unrestricted exchange of meteorological, hydrological, and related data and products, which are essential for all real-time weather, climate, water, and related environmental services, as well as for the assessment of the evolution of the climate system and is an important factor in matters relating to safety and security of society, economic welfare and the protection of the environment.

WMO is one of the partners of ICID in bringing together climate and water communities to manage natural disasters like floods and droughts. ICID has consultative status with WMO, while WMO is represented in ICID's technical bodies that interest WMO such as WG-CLIMATE. ICID has been partnering with WMO in the Integrated Drought Management Programme (IDMP) and acts as a Support Base Partner of the Helpdesk on IDMP.

ICID and WMO signed a Memorandum of Understanding in September 2020 for a period of five years, heading into a long-term partnership. Recognizing the importance of improving, developing, and exchanging information and predictions in support of decision-making for water management, food security, climate risk management, and adaptation, ICID and WMO come together to improve international knowledge creation dissemination and service

provision. ICID and WMO share mutual goals of poverty alleviation through food and water security, and for that purpose, they support interventions to reduce risks due to water-related extreme floods and droughts and effective climate change adaptation. To achieve these goals, both WMO and ICID have a mutual interest and commitment to work on the better management of floods/ droughts and agricultural water using the latest tools, technology, and data.

World Water Council (WWC)

World Water Council is a French association founded in 1996, with its headquarters in Marseille, France. It has 382 members (November 2018) which include organizations from the UN and intergovernmental organizations, the private sector (construction, engineering and manufacturing companies), governments and ministries, academic institutions, international organizations, local governments, and civil society groups. ICID has been a founder member of WWC and served its Board of Governors (BoG) twice in the past. ICID has been actively involved in all World Water Forums since its inception. WWC is a Permanent Observer to ICID's Permanent Committees on Technical and Organizational Aspects.

The World Water Forum (WWF) is the world's largest event on the water. It has been organized every three years since 1997 by WWC in partnership with a host country. It brings together participants from all levels and areas, including government agencies, multilateral institutions, academia, civil society, and the private sector, and provides a unique platform where the international water community and key decision-makers can meet to plan long-term progress on global water challenges. The 9th WWF, held in Dakar, Senegal, 21-27 March 2022, with around 500 participants from around the world, was the first of its kind hosted in sub-Saharan Africa. This event focused on four priorities, namely: 1-Water security and sanitation, 2-Water for rural development, 3-Cooperation and 4-Means and Tools, including the crucial issues of financing, governance, knowledge management and innovation; four axes that constitute priorities for Africa and also for the world as a whole. ICID was represented at WWF9 through its President, Hon. Dr. Saeed Nairizi and Vice President Er. Alireza Salamat, organized two main thematic sessions on "Smart Water Management" and "Switching from Rural Development to Rural Transformation" during WWF on behalf of ICID. Both sessions were very well received by the participants of various countries attending this international event

OTHER PARTNERSHIPS

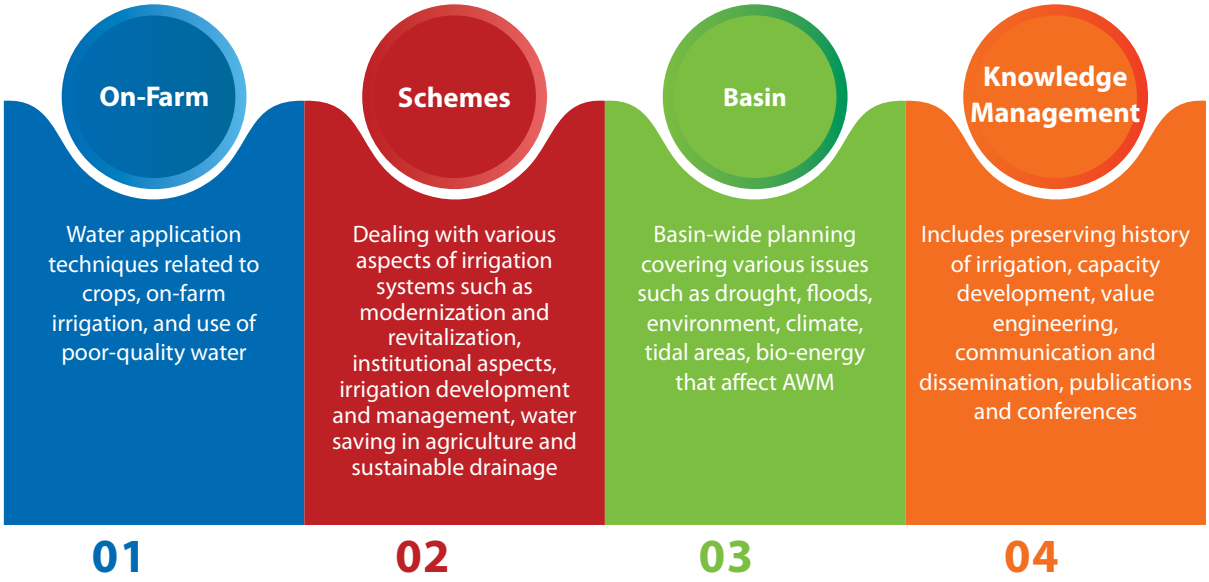
Besides the organizations mentioned above, ICID has been working in partnership with UNESCO-IHP, International Union for Conservation of Nature (IUCN), IHA, International Water History Association (IWHA), International Standards Organization (ISO), Association Scientifique et Technique pour l'Eau et l'Environnement (ASTEE), Network of Asian River Basin Organizations (NARBO), CIHEAM-Bari, Ministry of Agriculture, Forestry and Fisheries (MAFF) Japan, Indian Institute of Technologies, Khuzestan Water and Power Authority, World Historic and Cultural Canal Cities Cooperation Organization (WCCO), China Institute of Water Resources and Hydropower Research (IWHR), Korea Rural Community Corporation (KRC), UNESCO-RCUWM, Hydropower and Dams, European Geosciences Union Assembly, Saudi Water Forum in the areas of mutual interest, particularly emerging issues related to ICID's vision, mission, and goals.

Museum of the Water Civilization in Morocco “Mohammed VI”, Marrakech

A view of the cultural event organized by ANAFIDE

Photo: Madhu Mohanan, Communication Officer, ICID

Working Groups in Action



ICID's mission of 'A water-secure world free of poverty and hunger through sustainable rural development' can be better achieved through deliberations of its technical WGs, which are further organized around four strategic themes of ICID:
The WGs, through their activities, help generate, extract, compile, and synthesize the available knowledge for wider dissemination through ICID channels. Various WGs and TFs have been established to study different aspects of AWM. Experts voluntarily join from a wide range of disciplines like engineering, hydrology, agronomy, environment, sociology, economics, climate change, and so on, working as members, contributing, and sharing experiences across the geographical, climatological, economic, and social spectrum.

The following section briefly describes the activities of various ICID WGs under the four strategy themes (ST) during the year 2020-21:

STRATEGY THEME - ON-FARM

Irrigation is an integral part of agriculture to achieve increased crop production through reliable, precise, and sustainable water application to the crop. The management of on-farm water application is critically important for higher productivity, irrigation efficiency, and, most importantly, sustainability. Both the farmers and the irrigation managers are key players who need to make prudent decisions, which constitute a selection of the right crops based on water availability; selecting the most appropriate irrigation techniques for optimal utilization of scarce water resources matching the local context; reducing wasteful losses such as evaporation; using certified equipment; ensuring a minimum quality for on-field irrigation; recycling, and reusing water including the poor-quality water in case of limited, and so on. To discuss these issues, ICID has constituted three WGs: WG-WATER & CROPS, WG-NCWRI, and WG-SON-FARM.

Working Group on Water Food Energy Nexus (WG-WFE_N)

The erstwhile Working Group on Water and Crops (WG-WATER & CROP) was re-established in 2020 as "Working Group on Water Food Energy Nexus (WG-WFE_N)" with a revised mandate as follows: to exchange information, knowledge, and experience as well as to network on the Water-Food-Energy Nexus topic to be up-to-date with new developments, methods, and approaches. This can be the basis for a possible position paper on key issues on the nexus; to prepare an overview document on state of the art in improving water use efficiency and productivity within the nexus; to produce a document on the impact of climate change and possible use of non-conventional less water consuming crops; to prepare an overview document on state of the art on model applications as useful management tools for water, crops, field, and energy management within the nexus; to prepare, and present reports on case studies on recent developments in the countries that are represented in the WG; to organize international workshops, seminars, or symposia on the Nexus topic; and to implement ICID 2030 vision.

The WG organized two virtual meetings on 03 June 2021 and 14 September 2021. During the virtual meetings, Chair discussed various activities, such as the 3-year Rolling Plan based on the scoping document of the WG, preparing WG publication, multi-functionality of water use in paddy (rice) cultivation for the technical report of the group, international workshop in 2022, ICID-IWRA collaboration, etc.

The WG held its 1st meeting in November 2021 at Marrakesh, Morocco and reviewed the activities of the WG, such as goals/strategies, actions, outcomes/outputs, and milestones, as part of Action Plan of 'Road Map to ICID Vision 2030' and updated the progress.

WG decided to bring out a 'Technical Report' based on the work carried out so far, which includes – (i) efficient use of water in crop production, (ii) crop water models, (iii) multi-functional water use in paddy, and (iv) rainwater harvesting and energy crops. In this regard, NCs of Australia, China, Egypt, India, Indonesia, Philippines and Italy have contributed their papers to the Technical Report of the WG.

The WG is organizing an International Workshop on 'The Water-Energy-Food-Nexus: Implementation and Examples of Application' on 4 October 2022 during the 73rd International Executive Council (IEC) meeting and the 24th ICID Congress in Adelaide, Australia. The objective of the workshop is to bring together experts to share information, experience and views on how to apply the principles of water-food-energy nexus in agriculture. The workshop will focus on the following topics: (i) Water-Energy-Food-Nexus at the field, regional and country scales, examples of applications; (ii) How the environment and ecosystem services benefit from the Nexus; (iii) Economic analysis of food production within the nexus; (iv) Management practices that promote the Nexus; and (v) Institutional and Governance issues in implementing the Nexus.

In order to promote the webinars of the WG, the group organized the two webinars on the topics "Suitable water, crops and land management for water-stressed regions" on 17 June 2021 and "Climate Smart Agricultural Water Management: Best Practices, Policy Framework and Way Forward" on 06 August 2021.

WG Chair Dr. Ragab Ragab (U.K) has evolved the latest version of SALTMED software and published paper titled 'SALTMED publication in Irrigation and Drainage' which is available at https://onlinelibrary.wiley.com/doi/toc/10.1002/(ISSN)1531-0361.saltmed-publications.

Use of Non-Conventional Water Resources for Irrigation (WG-NCWRI)

Working Group on Use of Non-Conventional Water Resources for Irrigation (WG-NCWRI) was established in 2018 with a mandate to exchange knowledge, experience, and data as well as networking in respect of new developments, methods, and approaches; prepare comprehensive reviews and prospects concerning different aspects of NCWR; produce technical manuals, guidelines or standards to all NCWR including wastewater, drainage water, and saline/brackish water; organize international workshops, seminars, and meetings on the NCWR topic; produce documents

on successful case studies with new developments taking into consideration the NCWR case studies presented by the members from different countries; enhance the membership of the WG by encouraging more member countries to join the group where the use of non-conventional water is a common practice for irrigation management.

The group organized the first virtual meeting on 05 August 2021, while the second virtual meeting was held on 20 October 2021. During the Morocco meeting, the group discussed the organization of a workshop on NCWR, capacity-building training, preparation of guidelines, etc. As part of the Road Map to ICID Vision 2030, Dr. Tasuku Kato (Japan) is finalising a case study document on the use of non-conventional waters in different countries, and Dr. Wenyong Wu (China) is preparing the draft document on reclaimed water irrigation guideline, and Dr. Anna Tedeschi (Italy) is preparing guideline document on the use of brackish water for irrigation. During the 72nd IEC in Morocco, Dr. Tapas Kumar Biswas from Australia was elected as Vice-Chair of WG. Dr. Tapas Biswas is organizing a training course on "Digital application in the use of non-conventional water resources".

WG is organizing an International Workshop on "Nonconventional Irrigation in High-Value Agriculture – Application of Modern Technologies" in October 2022 during 25th ICID Congress in Adelaide, Australia. This Workshop will bring together experts from all over the world to share information, experience, and views on the applications of modern technologies in non-conventional water irrigated high-value agriculture. This workshop is focused on using non-conventional water more efficiently in high-value agriculture to achieve a closed-loop future for water in view of the greater need for resiliency, efficiency, and smart management. There are already numerous in-situ sensors and remote sensing in use in orchards for efficient water, salt, and nutrient management. Precision horticulture is more about managing orchards for uniform growth and production year after year, where smart technology is or will be playing an ever-increasing role when it comes to making the industry sustainable with minimum or zero footprints.

Sustainable On-Farm Irrigation System Development (WG-SON-FARM)

The Working Group on Sustainable On-Farm Irrigation System Development (WG-SON-FARM) was established in 2015 to support research, evidence-based documentation, and dissemination of knowledge based on the latest scientifically significant and societally relevant issues. The WG will make recommendations for the design, installation, management, and maintenance of on-farm irrigation structures and water distribution system networks.

The group organized one virtual meeting on 9 September 2021. During the Morocco meeting in November 2021, the group discussed the activities viz. publications, presentations, webinars, 10th International Micro Irrigation Conference, International Workshop, etc. As part of the Road Map, the group is planning for presentations on position, overview, and technical papers, as three papers and one article in 2022. WG is planning to organize an International Workshop on Micro Irrigation Systems Impacting Agricultural Growth and Farm Incomes in 2023. The updated table of sprinkler and micro areas in descending order is available at <https://icid-ciid.org/icid_data_web/sprinklerandmircro.pdf>.

Mr. Carl Walters and his team delivered the 3rd Webinar entitled "Organization of Irrigation Automation Systems" on 22 July 2021. The speakers and panellists of the events were - Dr. Iven Mareels - Director of the Centre for Applied Research, IBM Australia, and Dr. Danlu Guo - Research Associate at the Infrastructure Engineering Department at the University of Melbourne, Er. Paul Byrnes - Director of PAQUA Consulting, and Er. Damien Pearson - Global Business Development Manager with Rubicon Water.

The Moroccan National Committee of ICID is organizing the 10th International Micro Irrigation Conference (IMIC) on the theme "Micro Irrigation in the era of technology innovation and digital transformation" from 25-27 January 2023 in Dakhla, Morocco.

The Working Group on Sustainable On-Farm Irrigation System Development (WG-SON-FARM) was established in 2015 to support research, evidence-based documentation, and dissemination of knowledge based on the latest scientifically significant and societally relevant issues. The WG will make recommendations for the design, installation, management, and maintenance of on-farm irrigation structures and water distribution system networks. As part of the Road Map to ICID Vision 2030, the group is (i) preparing an overview paper by 2022, (ii) will be organizing second and third workshops in 2021 and 2022 respectively, (iii) updating the database on micro, and sprinkler irrigation, (iv) preparing a paper entitled "Conceptual approach, and research tools required in developing Overview, thematic, and position papers". The group will organize an International Workshop in 2023 on "Micro-

Irrigation Systems Impacting Agricultural Growth and Farm Incomes". The 10th International Micro Irrigation Conference (IMIC) on the theme "Micro-irrigation in the era of technology innovation and digital transformation" will be held in 2022 at Agadir, Morocco.

Professionals who are already working in the area of agricultural water management (AWM) have had limited exposure to Micro Irrigation Systems (MIS) concepts and practices, so ICID, in collaboration with the National Water Academy of India and two international industry leaders - Jain Irrigation Systems Limited (JISL), and NETAFIM Irrigation Private Limited - organized an online certificate course on Micro-Irrigation Systems from October 2020 to April 2021. Trainees experienced an intensive learning exercise through 35 online sessions comprising audio-video lectures, webinars, assignments, quizzes, hands-on activities, and face-to-face online interactions with the course faculty to earn an international certificate that will add value to their professional credentials.

STRATEGY THEME - SCHEMES

At the 64th IEC Meeting at Mardin, Turkey, 2013, the Strategy Theme "Systems" was renamed "Schemes." Presently, the irrigation sector is plagued with numerous challenges, including limitations on physical expansion of irrigated areas due to limited availability of water; dwindling land resources; fiscal constraints to expansion; competitive use of water from other sectors; deteriorating irrigation infrastructure due to vicious build-neglect-build cycle leading to poor, and unreliable performance of the projects; weak institutional foundation both at departmental, and farmer levels. If not addressed properly, these issues result in inefficient and sub-optimal use of irrigation projects. Keeping the importance of these inter-related factors, six Working Groups (WGs): WG-M&R, WG-IOA, WG-WATS, WG-IDM, WG-SDRG, and WG-RWH have been formed under this theme to discuss, and develop strategies to address these challenges.

Modernization and Revitalization of Irrigation Schemes (WG-M&R)

Working Group on Modernization and Revitalization of Irrigation Schemes (WG-M&R) was established in 2015 to investigate, analyse, and disseminate information on new developments and formulate recommendations for planning and preparation for modernization and revitalization of irrigation schemes; interaction between modernization, revitalization and required operation and maintenance including their cost-sharing, institutional and organizational framework.

The group organized its first virtual meeting on 22 March, while the second virtual meeting was held on 23 August 2021. During the Morocco meeting in November 2021, the working group discussed the organization of international workshops, guidelines for publication, a position paper, developing norms of O&M of irrigation systems, etc. The group organized the virtual meeting of the core team of WG-M&R on 14 February 2022 and discussed the work plan and coding & analysis of responses to the questionnaire. The questionnaire on "Norms and Processes for Operation and Maintenance (O&M) of Irrigation Systems" developed by Maria Del Ros Reyes (Philippines) was circulated to all National Committees, International Organizations, Institutions, and professionals in the field of water management to get data.

The working group is organizing an International Workshop on "Modernizing Irrigation and Drainage Services" in October 2022 in Adelaide, Australia. The main theme of the International Workshop is Modernizing Irrigation and Drainage with a focus on the arrangements for the provision of irrigation services. Arrangements for upgrading irrigation and drainage services go beyond rehabilitation of infrastructure to include the institutional and management arrangements required to enable irrigation supplies responsive to farmers' requirements. The objective of the workshop is to bring together irrigators, system operators and researchers to present and discuss the current state of knowledge and experiences in creating irrigation and drainage services that are responsive to the changing needs of farmers and the environments in which irrigation and/or drainage takes place. WG is also planning to organize an International Workshop during the 4th World Irrigation Forum (WIF4) in Beijing in April 2023.

Institutional and Organizational Aspects of Irrigation/ Drainage System anagement (WG-IOA)

ICID established the Working Group on Institutional and Organizational Aspects of Irrigation/ Drainage System Management (WG-IOA) in 2015 to scrutinize a variety of institutional and organizational aspects related to irrigation, drainage development, and management. The focus of this scrutiny is on the mechanism and working improvement with the organizational arrangement approaches for successful participatory irrigation and drainage management (PIDM) transfer, working mechanism and involvement of the public-private partnership (PPP), mechanism of charging of irrigation and drainage services as well as determination of the level of cost recovery.

The group organized virtual meetings on 23 July and 21 October 2021. During the Morocco meeting in November 2021, the group discussed the preparation of chapters for publication, the schedule for the final report of the WG, the organization of the international workshop, etc. The group is planning to finalize the publication "Institutional and organizational reform in irrigation and drainage sector for sustainable agriculture water management" and launch the Final Report of WG-IOA during the 75th IEC meeting in November 2023 in Visakhapatnam (Vizag), Andhra Pradesh State, India. VPH Ding Kunlun (China) shared the chapter titled "Observed Impacts of PIM" while Mr. Taku Mori (Japan) shared the chapter titled "Legal Frameworks" as a contribution to the final report.

The group is organizing an International Workshop on "Public-Private Partnership (PPPs) in Irrigation and Drainage Operation and Maintenance toward sustainable Irrigated Agricultural water management" on 04 October 2022 in Adelaide, Australia. The main objective of the workshop is to follow up the IOA Workshop in Bali, Indonesia that was conducted on 2nd September 2019 on the theme "Participatory Irrigation/ Drainage Management – PIDM and Management Transfer, Approaches and condition for successful PIDM"

Irrigation Development and Management (WG-IDM)

Keeping in view the importance of irrigation development and its management, the Working Group on Irrigation Development and Management (WG-IDM) was established in 2015 to look into the various issues associated with IDM with the broad scope of assessment of water demand; development of water resources including groundwater, and economic scarcity of water; social drivers and resistance to the development of irrigation, and progress in water management.

The group organized a virtual meeting on 2 July 2021. During the Morocco meeting in November 2021, the group discussed the activities as part of the Road Map to ICID Vision 2030, publications, updating MTD, etc. Dr. Amgad Elmahdi (Australia) shared the table of contents of the publication titled "Guidelines on relevant water balance approach" with the Group for feedback. As part of updating the Multilingual Technical Dictionary (MTD), Dr. Katsuyuki Shimizu shared the updated terms related Headworks, Design of irrigation canals, Canal structures, Project Water Management, and Operation, maintenance and management. Dr. Amgad Elmahdi (Australia) also volunteered to contribute to the Arabic translation of MTD in cooperation with the Egyptian National Committee on Irrigation and Drainage (ENCID).

Water Saving in Irrigated Areas (WG-WATS)

The Working Group on Water Saving in Irrigated Areas (WG-WATS) was established in 2015 with the mandate - of water accounting and irrigation auditing (and other ancillary uses); irrigation water measuring devices; assessment of water loss in various components of irrigation systems; various methods and techniques used for water saving in irrigation, etc. The working group organized its virtual meeting on 07 September 2021. During the Morocco meeting in November 2021, the group discussed the activities as part of the Road Map to ICID Vision 2030, publications, presentations by WatSave Award winners, updating the Multilingual Technical Dictionary (MTD), completion of the

mandate of the WG, etc. During the 72nd International Executive Council (IEC) meeting held in December 2021, based upon the recommendation of PCTA, the Council approved the extension of WG till 2023 to complete the remaining and ongoing activities.

In 2021, fifteen nominations were received for the WatSave Awards viz. Technology (6); Management (6); Young Professionals (2); Farmer (1) from 8 National Committees. The winners of the WatSave Awards were - Dr. Abdrabbo Abdel-Azim Abdrabbo Shehata (Egypt) for Technology, Mr. Ahmed EL Bouari (Morocco) for Management, Dr. Alison McCarthy (Australia) as Young Professional, Mr. Gholamreza Ansari (Iran) for Farmer category.

Land Drainage (WG-LDRG)

The Working Group on Land Drainage (WG-LDRG) was established in 2020 to look into the aspects related to drainage. The group is planning to bring out the publication of the working group besides exchange of information and overview of key books and other publications, collecting and reviewing manuals, guidelines, codes of practice, etc. The updated database of the drained area is available at <https://icid-ciid.org/icid_data_web/World-drained-areas.pdf>. ICID has taken the initiative to document the development of irrigation and drainage schemes in the world by establishing an online Register on "World Irrigation and Drainage Schemes (WI&DS)." WI&DS will fulfil the need for a much-awaited global repository of information in systematic irrigation and agricultural water management. Irrigation projects having 5000 Hectares and above of command area can submit their information for inclusion in the register. The irrigation projects approved by National Committee/ ICID Central Office for inclusion are entitled to Certification. The review process and other details are outlined on the portal <https://wip.icidevents.org/> in detail.

A proposal has been received from Deputy Director, Agency for Land Reclamation and Irrigation under the Government of the Republic of Tajikistan and Deputy Chairman of the National Commission on Irrigation and Drainage in the Republic of Tajikistan (TajNCID) for the organization of the 14th International Drainage Workshop (IDW) in Dushanbe, Tajikistan in September 2023 under the theme of "Modernization of irrigation and drainage systems for adaptation to climate change and sustainable development."

Rain Water Harvesting (WG-RWH)

The Working Group on Rain Water Harvesting (WG-RWH) was established in 2018 with the mandate to promote rainwater harvesting as a natural, local, efficient source of water under the key principles of rainwater harvesting; provide research, and advice from a range of disciplines to inform rainwater harvesting, irrigation, and agricultural practices including water management, land use planning, policy environments, stormwater management and manufacturing; and provide Rainwater Harvesting Codes of Practice suitable for urban and agricultural use.

During 24th Congress in October 2022 in Australia, WG is planning to organize a tour of Adelaide Botanic Gardens Water Sensitive Urban Design features and a tour of the Conference Product Exhibition Rainwater Harvesting zone to meet local practitioners and product manufacturers and better understand Australian and international rainwater harvesting technologies and opportunities.

Mr. Michael Smit (Australia) delivered a webinar on "Rainwater Harvesting vs Traditional Catchment Storage" on 15 July 2021 and shared the Australian experience of declining runoff in traditional surface storage catchments despite significant rainfalls. Mr. Michael Smit hypothesized that increasing temperatures and changes to land management practices had changed the runoff behaviour of the catchment, with some medium-sized river networks ceasing to flow for extended periods.

STRATEGY THEME - BASIN

The Strategy Theme 'Basin' addresses all basin-level factors and influences such as climate change, environmental issues, irrigation in tidal areas, irrigation in water-stressed regions, flood management, and increased use of water for bioenergy crops. ICID has constituted seven WGs under this strategy namely, WGCLIMATE, WG-SDTA, WG-ENV, WG-MWSCD, WG-IDSST, and WG-AFM. The activities of the WGs are as follows:

Climate Change and Agricultural Water Management (WG-CLIMATE)

To address the issue of climate change in agricultural water management, ICID established the Working Group on Climate Change and Agricultural Water Management (WG-CLIMATE) in 2015. The main mandate of the WG is – (i) To share the information about the prediction of the global and regional climate change and climate variability; (ii) To explore and analyze the implications of climate change and climate variability for agricultural water management, including irrigation, drainage, and flood control; (iii) To promote archiving useful information and case studies on climate change for practical use in improved impact assessment and adaptation development; (iv) To enhance discussion on climate change and water management at national and regional scales among the stakeholders including academician, practitioners, decision-makers, media as well as farmers and water users in a region.

The working group organized the online meetings on 11 August 2021 and 29 October 2021. During the Morocco meeting in November 2021, the group discussed the publication and tenure of the WG. After discussion, members proposed for extension of two years for WG to complete the mandate and finalize the publication. During the 72nd International Executive Council (IEC) meeting held in December 2021, based upon the recommendation of PCTA, the Council approved the extension of WG till 2023 to complete the ongoing activities.

President Dr. Ragab Ragab attended COP26 and spoke about the WG-CLIMATE's activities and contributions. President Dr. Ragab made a presentation on "Agriculture Water Management Under Climate Change" at Glasgow University, U.K, held on 28 October 2021, just ahead of COP26. Climate change affects the water supply and in some parts of the world widens the gap between water supply and demand. Water supply, in turn, affects agricultural water needs (irrigation consumes around 70% of global freshwater resources). In addition, flood and drought events have an impact on drainage and the entire agricultural water management system.

Sustainable Development of Tidal Areas (WG-SDTA)

The Working Group on Sustainable Development of Tidal Areas (WG-SDTA) was re-established in 2017 with a revised mandate: to understand the existing and potential challenges and opportunities of tidal areas for the present and future by figuring out underlying issues; to raise awareness of the increasing risk on tidal areas due to global climate change and stimulate interdisciplinary discussions on impacts, mitigation and adaptation; to enhance survey, design techniques and monitoring, management programs for irrigation and drainage facilities, and to collect information about the tidal area environment around the world; to identify sustainable development and management options in tidal areas, and find a balance between the conservation and development of tidal areas with acknowledgment of ecosystem services; to join the international dialogues, and organize international conferences and short courses to promote interdisciplinary and participatory land and water planning and management in tidal areas; to collaborate with other related working groups actively and to exchange relevant experiences amongst NCs and the least developing countries. The WG selected its new Secretary, Mr. Paavan Kumar Reddy (India).

The WG-SDTA held its 4th meeting on 28 November 2021 and reviewed the Action Plan (Road Map to ICID Vision 2030) based on the new mandate by updating the activities on sustainable development of tidal area issues and providing the updated action plan for 2018-2023. The WG will bring out a Special Issue with the support of Prof. Hsiao-Wen Wang (Chinese Taipei Committee).

The WG organized its first virtual meeting on 20 July 2021. The group discussed the Action Plan 2030 (Road Map to ICID Vision 2030), the International Workshop plan to be held in October 2022, Short Course on 'Tidal Prediction and Land Subsidence Prevention and Reclamation'; Side Event on 'Global challenges and land subsidence in tidal areas and the integrated solution'; web-based seminars and e-discussions; and prepare two-page country papers based on the questionnaire of country note - Sustainable Development of Tidal Areas from the NCs.

The WG is organizing an International Workshop titled 'Integrated Solution for Irrigation and Drainage Tails and Land Subsidence in Tidal Areas' on 03 October 2022 during the 73rd International Executive Council (IEC) meeting and 24th ICID Congress in Adelaide, Australia. The objective of the workshop is to bring together the practitioners, researchers and scientists, managers, and decision-makers and obtain input from member countries to explore practical problems, discuss the current state of knowledge and experiences, and exchange solving strategies so as to respond to the urgent needs. To better disseminate the efforts addressing the challenges and learn from each other, papers presented at the workshop will be considered to be published in a special issue of ICID's International Journal of Irrigation and Drainage. The workshop will focus on the following topics: (i) Adaptation measures and strategies to strengthen irrigation, drainage, and flood prevention facilities in tidal areas; (ii) Case studies and knowledge and experiences towards a better understanding of practical issues; and (iii) Institutional management and stakeholders' participation in addressing pressing challenges.

In order to develop the 2-page country papers, the WG members have submitted the following papers: 'Coping with Climate Change in a Densely Populated Delta: A paradigm Shifts in Flood and Water Management in The Netherlands' by Ir. Henk Rizema (The Netherlands); 'Sustainable Development of Tidal Areas in Japan' by Dr. Ikuo Yoshinaga (Japan); 'Sustainable Development of Tidal Areas in Malaysia' by Dr. Nor Hisham Mohd Ghazali (Malaysia)' 'Spatial Development and Land Resilience on Sustainable Development of Tidal Area in Taiwan' by Benson Lin, Ruey-Chy Kao (Chinese Taipei Committee); 'Enhancing Climate Resilience of India's Coastal Communities – Ecosystem-based adaptation in coastal India' by Mr. Paavan Kumar Reddy Gollapalli and Dr. Vijay K. Labhsetwar (India).

Environment (WG-ENV)

Keeping in view the importance of the environmental aspects in agriculture water management, the Working Group on Environment (WG-ENV) was established in 2015 with the mandate to guide policymakers, planners, designers, and managers in the irrigation and drainage sector on the environmental aspects of irrigation and drainage systems, and to address concerns to the effects on local, regional, and global common goods, such as climate, biodiversity, and human health.

The working group organized the virtual meeting on 06 May 2021 and discussed the Road Map to ICID Vision 2030, reviewed papers and case studies for publication, etc. During the Morocco meeting in November 2021, the group discussed the format of the publication and whether it should be organized based on ecosystem services or measures such as irrigation, paddy fields, controlled drainage, etc. WG decided to develop a discussion paper by the Chair, Vice Chair, and Secretary, Dr. Yutaka Matsuno, Dr. Aynur Fayrap, and Dr. Carl Walters, before a specific publication is proposed to the Journal Irrigation and Drainage. So far, 9 case studies have been submitted by the members.

During the Morocco meeting, members discussed and proposed to seek an extension of the term of the WG until the end of 2022 so that the review of paper and other pending issues could be completed. During the 72nd International Executive Council (IEC) held in December 2021, based upon the recommendation of PCTA, the Council approved the extension of WG till 2022.

Managing Water Scarcity Under Conflicting Demands (WG-MWSCD)

The Working Group on Managing Water Scarcity under Conflicting Demands (MG-MWSCD) was established in 2016 with a mandate to collect information, knowledge, and, where available, case histories on actions taken to manage water systems to accommodate a change in priority of water use due to conflicting demands at National, area or basin, and local level; to review and analyze information to determine any commonality; to prepare and present reports and/or case studies on recent developments in the countries that are represented in the WG; to organize an international workshop on the topic, and to prepare an overview paper on the topic for publication.

The WG-MWSCD organized its first virtual meeting on 25 August 2021. During the online meeting, the group discussed various activities as part of the Road Map to ICID Vision, including international workshops, publications, webinars, etc.

The WG held its 5th meeting on 28 November 2021, reviewed the Action Plan (Road Map to ICID Vision 2030) based on the mandate of the WG, and developed an action plan for 2018-2022. The group will complete the draft indices, guidelines and technical summary report in 2022 and finalize the same in 2023 based on the mandate of the WG.

The working group is organizing an International Workshop on 'Managing on the Regional, State or Local Level Water Scarcity Resulting from Conflicting Demands' in October 2022 during the 24th ICID Congress & 73rd IEC meeting in Adelaide, Australia. The objective of this workshop is to obtain input from member countries of case histories on managing water scarcity under conflicting demands. The data collected from the workshop will be used for completing the output of the working group as per the Action Plan. The workshop will focus on the following topics – (i) Assessment of water use in different sectors for understanding water scarcity at different scales (regional and local); (ii) Holistic and participatory best management practices that can be used by different levels of users (organization and individual) at different scales; (iii) Legal or policy-based approach for solving conflict situations, including water trading; and (iv) integration of technical, management and policy level approaches.

In order to promote the webinars of the WG, Ms. Terri Edwards (USA) and her team delivered the first Webinar on the topic 'Dividing the Waters: A History of Litigation in the Truckee River Basin and the Hope for the Future' on 28 May 2021. Ms. Terri Edwards and Mr. Clarke Ballard (Australia) and Dr. Jaepil Cho (South Korea) were the Speaker and Panellist of the Webinar. The second Webinar on the topic 'Suitable Water, Crops and Land Management for Water Stressed Regions' was delivered by ICID President Dr. Ragab Ragab (UK), Chairman of the WG, on 17 June 2021. Chairman Dr. Ragab Ragab and VPH Franklin E. Dimick (USA) were the Speaker and Panellist of the Webinar.

Irrigation and Drainage in the States under Socio-Economic Transformation (WG-IDSST)

The Working Group on Irrigation and Drainage in the States under Socio-Economic Transformation (WG-IDSST) was established in 2018 with the mandate to develop and strengthen the network among the countries of transition based on the establishment of monitoring and evaluation of common problems in the States, and bring it to the attention of decision-makers in states; to create a database, and exchange of information about changing situation in Irrigation and Drainage in these States, and to attract global, and national attention to existing trends affecting global, and national food security, and wellbeing of rural population; especially related to climate change and ability to adapt to it; to monitor the ecological situation in the transition states, including problems of the closed basin (Aral Sea, Lake Chad, Lake Victoria, Caspian Sea), rivers deltas, salinization, and waterlogging, land desertification, etc.

The 72nd IEC approved Dr. Shukhrat Mukhamedjanov (Uzbekistan) as Vice-Chair of the working group. WG organized the virtual meeting on 23 April 2021 and discussed the importance of exchanging the member countries' experiences, especially about proper management of water resources during water scarcity years, as it could improve in development of effective mitigation measures in the WG member countries.

Scientific-Information Center of the Interstate Commission for Water Coordination of Central Asia (SIC ICWC) prepared a special window in the CAWater-Info portal for the WG to exchange information on monitoring and evaluation of common problems. Currently, the special window is ready to use and accepts any information in two languages i.e., English and Russian. Dr. Mukhamedjanov shared information about the IWRM experience in Central Asia in the IWRM in Fergana volley project carried out by SIC ICWC in 2002-2012, funded by the Swiss Agency for Development and Cooperation. The project was carried out on the territory of three Central Asian states in Kyrgyzstan, Uzbekistan, and Tajikistan. Dr. Shavkat Kenjabaev (Uzbekistan) made a presentation about the results of two expeditions to the dried bed of the Aral Sea in 2019-2020 as a contribution to activities planned for 2021 under the framework of the updated Road Map to ICID Vision 2030.

Adaptive Flood Management (WG-AFM)

The Working Group on Adaptive Flood Management (WG-AFM) was established in 2018 with a revised mandate to motivate ICID National Committees in various countries to set up their National Working Groups; to provide guidance to compile, publish, update, and/or translate documents on adaptive flood management; to promote the inter-disciplinary exchange of information, knowledge, and experience, as well as to network for a proper understanding of the technological developments in the subject; to organize seminars at ICID Congresses, and meetings to strengthen adaptation to and to cope with floods including community participation with a focus on the impact of floods on agriculture water management; to prepare a paper on 'Adaptive Flood Management' for publication in Irrigation and Drainage (IRD); to finalize a book on 'Adaptive Flood Management' about coping with uncertainties, and learning to manage dynamic systems more effectively.

The WG held its 3rd meeting on 27 November 2022 and reviewed the Action Plan (Road Map to ICID Vision 2030), keeping in view the ongoing activities like the publication of papers in IRD Journal, international workshop, finalising the publication of the WG on adaptive flood management, and developed a fresh action plan for 2018-2022.

WG is organizing an International Workshop on 'Adaptive Flood Risk Management: Opportunities and Challenges' in October 2022 during the 24th ICID Congress 73rd IEC meeting in Adelaide, Australia. This workshop will bring together flood experts from all over the world to share information, experience, and views on how to implement the Adaptive Flood Management strategies. The workshop will focus on the following topics – (i) Adaptive Management Concepts and applications in Water Engineering; (ii) Uncertainties in flood management; (iii) Integration of structural and non-structural approaches; (iv) Case studies of adaption of new environments; (v) Reduction of uncertainties over time via system monitoring; and (vi) Learning while doing in flood projects.

The group decided to publish a publication titled 'Adaptive Flood Risk Management' with country case studies, covering both structural and non-structural aspects of flood management based on the workshop papers and country presentations on floods.

Dr. Kamram Emami, Chairman of the WG-AFM and Ir. Nor Hisham bin Mohd Ghazali (Malaysia) made their presentation on 'Worldwide experiences of Adaptive Flood Management' and 'Worldwide experiences of Adaptive Flood Management', and 'Experiences of Integrated flood management', focusing on SMART dual-purpose tunnel during the Morocco meeting in November 2021.

STRATEGY THEME - KNOWLEDGE

Knowledge is crucial for successful and sustainable development initiatives in the AWM domain. Knowledge management involves how it is collected, organized, communicated, shared, and improved and needs to be given due attention to achieve the mission and vision of the organization. It is equally important that all stakeholders have access to information and knowledge, both traditional and new, that is based on scientific evidence. It is the knowledge that empowers individuals to make sound decisions at all levels of AWM, starting from water policy-making to irrigation infrastructure development and operation to farm-level water application. Knowledge also develops by sharing of learning from historical irrigation systems, new research, and technology development. Accordingly, ICID formed several working groups/task forces under the theme of knowledge, such as EB-JOUR, WG-HIST, WG-CDTE, and TF-VE. Brief activities conducted during the year are as follows:

ICID Journal Editorial Board (EB-JOUR)

The ICID Journal Editorial Board (EB-JOUR) was established in 1994 with the following mandate: to ensure with the (Joint) Editor(s) that the Journal is published as per editorial policies; to select and recommend to IEC, through PCTA, the appointment of (Joint) Editor (s), Associate Editors, and Members; to review, and update editorial policies when required, to conform with the developing ICID objectives; to address, and resolve issues about the Journal; and to review guidelines for authors, manuscript reviewers, and book reviewers, and liaise, and coordinate with ICID work bodies.

Since March 2001, the Journal has been renamed 'IRRIGATION AND DRAINAGE - Managing Water for Sustainable Agriculture - The Journal of the International Commission on Irrigation and Drainage' and is published by M/s. Wiley-Blackwell under the full editorial responsibility of ICID.

The EB-JOUR held its 28th meeting on 28 November 2021 and reviewed the Action Plan (Road Map to ICID Vision 2030) based on the mandate by updating the activities on Editorial Board for 2018-2022. The Board elected its new Associate Editors - Dr. Wang Zhen (China) and Prof. Rameshwar S. Kanwar (USA). Dr. Wang Zhen will also act as the Secretary for the Editorial Board.

History of Irrigation, Drainage and Flood Control (WG-HIST)

The Working Group on History of Irrigation, Drainage and Flood Control (WG-HIST) was established in 2017 with a mandate to motivate ICID National Committees in various countries to set up their National WGs on History; to guide and compile, publish, update, and/or translate documents on the history of irrigation, drainage, and flood management; to prepare a paper on "Historical Water Sustainability" for publication in Irrigation and Drainage; to finalize a book on "Historical Water Sustainability."

During the Morocco meeting in November 2021, the working group discussed the publication "Historical Water Sustainability" and decided to finalize the publication by the end of June 2022. The final edited version of all the chapters for the publication is under review by the Chair Dr. Kamran Emami.

In 2021, 16 historical projects were nominated from China, Japan, India, Morocco, Iraq, South Korea, and Sri Lanka for World Heritage Irrigation Structures (WHIS) initiative.

Capacity Development, Training, and Education (WG-CDTE)

It is evident that in order to meet the growing food demand for the rapidly growing world population, the second green revolution has to be centered on the smallholder farmers in Africa and improved water use efficiency and production in large irrigation systems in Asia. A lack of capacity is identified as a constraint to the development of productive and viable irrigated systems. Both Asia and Africa will need a well-informed, skilled and technology-savvy contingent of agriculture scientists, irrigation engineers, and extension service workers to support this effort. Capacity development has to be linked to the overall goal of the sector and serve the purpose of the ultimate beneficiaries – the irrigation community. There is a need for systematic capacity development of both institutions and individuals in terms of developing enabling environment for institutional reforms and good governance, supporting institutional capacity, and supporting policy development.

Keeping in view, the importance of capacity development, training and education, ICID established the Working Group on Capacity Development Training, and Education (WG-CDTE) in 2015 with the following mandate: to coordinate, and guide the knowledge management activities of ICID, and the capacity development activities of different WGs; to compile the status of training, and educational programs offered in different regions; to compile the educational programmes being offered in irrigation, and drainage in different regions; to Identify the training, and education requirements, and identify gaps in available training programs, explore the feasibility of developing e-Learning programme and prepare guidelines for their development to support education and training programs, and webinars; to explore the scope of use of ICTs in capacity development including distance learning, and implement them where feasible; to oversee the establishment, and functioning of a Technical Support Unit for supporting NCs; and to facilitate the process of balancing education, and training requirements, and provision of training services.

The WG-CDTE organized its first virtual meeting on 1st April 2021. During the online meeting, the group discussed various activities as part of the Road Map to ICID Vision, YP training & educational programmes, workshops, webinars, e-discussions etc.

The WG organized its 6th meeting on 28 November 2021 and reviewed the Action Plan (Road Map to ICID Vision 2030), including the activities on capacity development, training and education issues. The group supported capacity development activities for young professionals, including the dissemination of knowledge through webinars, and e-learning programmes to help them develop their capabilities and overcome any knowledge or skill gaps. WG is compiling the status of training and educational programs offered in different regions, especially in the irrigation and drainage sector. Dr. Wen-in Shu (Chinese Taipei Committee) and Dr. Ashok Kharya (India) have shared a list of training institutes/organizations, including short-term educational programmes.

As part of the capacity development programme of YPs, the WG supported the 4th African Young Water Professional's Forum (Af-YWPF) virtually (online) organized from 25-27 October 2021 under the platform of Cairo Water Week (CWW) 2021. The theme of the Forum was 'Water, Population, and Global Change: Challenges and Opportunities''. The three-day event brought together 154 young professionals from Africa, covering 31 African countries.

In line with the mandate of the WG, ICID, in association with the Moroccan National Committee on Irrigation and Drainage (ANAFIDE) and African Regional Working Group (AFRWG) organized a 5-day training program for young professionals (YPs) from 19 to 23 November 2021 at Marrakesh, Morocco during the 5th African Regional Conference. The theme of the training programme was 'Micro Irrigation Systems to Mitigate Climate Change Impacts' under six sub-themes. About 45 participants from about 15 countries attended the training programme.

Value Engineering (WG-VE)

Value Engineering (VE) is an internationally practised methodology to achieve the required product, process, services and system at the minimum possible cost by analysing their functions and life cycle costs. Today, VE needs to be applied with greater rigour than ever before to meet the current global business need of sustainable development and growth. VE is an intensive, interdisciplinary problem-solving activity that focuses on improving the value of the functions that are required to accomplish the goal or objective of any product, process, service, project or organization. In other words, the Value Methodology (VM) is a systematic and structured approach that improves products and processes. VM helps achieve a balance between required functions, performance, quality, safety, and scope with the cost and other resources necessary to accomplish those requirements.

Keeping this in view the importance of VE, the Task Force on Value Engineering (TF-VE) was established in 2012 to promote the application of Value Methodology (Value Engineering, Value Analysis, Value Planning, Value Management, and Value Engineering Change Proposal (VECP)) in irrigation, drainage, and flood management projects to increase benefits, reduce costs, and ensure sustainable irrigated agriculture.

The erstwhile Task Force on Value Engineering (TF-VE) completed its tenure in 2017. On completion of the term of the TF-VE, a new Working Group on Value Engineering (WG-VE) was established with the following revised mandate: to motivate ICID National Committees in various countries to set up their National Working Groups on VE; to provide guidance to compile, publish, update, and/or translate documents on Value engineering projects (irrigation, drainage, flood management, and river engineering); promote an inter-disciplinary exchange of information, knowledge, and experience, as well as networking on the topic; to organize seminars at ICID Congresses, and meeting to enhance awareness on the importance of Value Engineering; to prepare a paper on "Application of Value Engineering in Irrigation and Flood Projects" for publication in Irrigation and Drainage (IRD); to finalize a book on "Application of Value Engineering in Irrigation and Flood Projects"; and to encourage member countries to produce papers on Value Engineering case studies.

An e-publication of the TF compiled and edited by the Chairman Dr. Emami titled 'Value Engineering for Savings in Irrigation, Drainage and Flood Management Projects' has been finalised and uploaded on the ICID website https://icid-ciid.org/icid_data_web/TF_VE_e-Publication2021.pdf for dissemination to all stakeholders.

Task Force to Guide ICID Inputs to World Water Forum 9 (TF-WWF9)

Task Force to Guide ICID Inputs to World Water Forum 9 (TF-WWF9) was established in 2018 with the mandate to - monitor and provide inputs to 9th WWF by liaising with the National Committees and Work bodies; liaise with 9th WWF Program Committee and other International Bodies, including FAO, IWMI, APPC, WB, etc. In the 72nd International Executive Council (IEC) meeting held in December 2021, based upon the recommendation of PCTA, the Council approved the extension of TF till 2022 to complete the ongoing activities.

The World Water Forum is the world's largest event on the water. It has been organized every three years since 1997 by the World Water Council in partnership with a host country. It brings together participants from all levels and areas, including government agencies, multilateral institutions, academia, civil society, and the private sector, and provides a unique platform where the international water community and key decision-makers can meet to make long-term progress on global water challenges.

The 9th World Water Forum was held in Dakar, Senegal from 21-27 March 2022 wherein about 500 participants from around the world participated. It was the first of its kind hosted in sub-Saharan Africa. On behalf of the International Commission on Irrigation and Drainage (ICID), Dr. Saeed Nairizi, President Hon., and Er. Alireza Salamat, Vice President were responsible for holding two main thematic sessions during the forum. During the 9th World Water Forum, with the help of international organizations, TF-WWF9 organized Session 2.D.2 on "Switching from Rural Development to Rural Transformation" on 23 March 2022, and Session 2.D.4 on "Smart Water Management" on 24 March 2022. Both sessions were highly received by the participants of various countries attending this international event.

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PERMANENT COMMITTEE FOR TECHNICAL ACTIVITIES (PCTA), Asian Regional Working Group (ASRWG)

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African Regional Working Group (AFRWG), WG on Capacity Development, Training and Education (WG-CDTE)

VPH Dr. Irena Bondarik

European Regional Working Group (ERWG)

President Prof. Dr. Ragab Ragab

Working Group on Water Food Energy Nexus (WG-WFE-N)

VPH Dr. Ding Kunlun

TF for Updation and Maintenance of Multilingual Technical Dictionary (TF-MTD)

VPH Dr Franklin E. Dimick

Working Group on Managing Water Scarcity under Conflicting Demands (WG-MWSCD)

VPH Dr Charlotte de Fraiture

Working Group on Environment (WG-ENV)

VPH Ian Makin

WG on Modernization and Revitalisation of Irrigation Schemes (WG-M&R)

VPH Prof Peter Kovalenko

Working Group on Irrigation & Drainage in the States under Socio-Economic Transformation (WG-IDSST)

VPH Dr. Kamran Emami

Working Group on Adaptive Flood Management (WG-AFM) WG on History of Irrigation, Drainage and Flood Control (WG-HIST)/ WG on Value Engineering (WG-VE)

Mr. Brwyan Ward

Committee on Congresses/ Conferences (C-CONGR)

Dr. Ruey-Chy Kao

Working Group on Sustainable Development of Tidal Areas (WG-SDTA)

Dr. Wenyong Wu

Working Group on Use of Non-Conventional Water Resources for Irrigation (WG-NCWRI)

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Working Group on Rain Water Harvesting (WG-RWH)

PH. Dr Saeed Nairizi

Task Force to Guide ICID Inputs to World Water Forum 9 (TF-WWF9)

VPH Dr. Hafied A. Gany

Working Group on Institutional and Organizational Aspects of Irrigation/ Drainage System Management (WG-IOA)

Dr. A. K. Randev

Working Group on Sustainable On-Farm Irrigation System Development (WG-SON-FARM)

Ms. Mary Jean M Gabriel

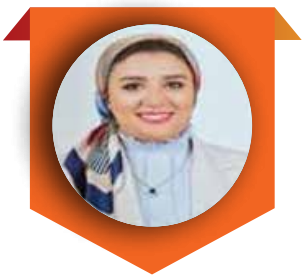
Working Group on Irrigation Development and Management (WG-IDM)

Mr. Bernard Vincent

Working Group on Land Drainage (WG-LDRG)

Dr. Ray Shyan Wu

Working Group on Climate Change and Agricultural Water Management (WG-CLIMATE)



Ms. Aya Mohammed Hassan Ali Elkholy

ICID Young Professionals e-Forum (IYPeF)

The Kutubiyya Mosque, Marrakech, Morocco.

Photo: Madhu Mohanan, Communication Officer, ICID

Activities at Regional Level

To achieve economic and social development, a progressive and sustainable transformation is required in all countries - developed or developing, market-oriented or centrally planned. However, the definition of 'sustainable development' varies for different development processes. In general, sustainable development is defined as the development that meets the needs of the present without compromising the ability of future generations to meet their own needs and offers the best path forward for improving the lives of people everywhere.

ICID's mission is to facilitate the exchange of knowledge and technology to promote water security, sustainable rural development, and increased crop yields to feed the world. In this endeavour, it has established various regional Working Groups (WGs) for bridging the communication process and promoting a stronger network among the countries in the region as well as international institutions for enhancing cooperation and coordination.

To achieve the goal of doubling food production in the region, WGs organize conferences on topics of current importance. Presently, three regions have active WGs – Africa, Asia, and Europe. The activities of these WGs and interaction with other regional groupings/gatherings that promote regional cooperation are presented in this chapter.

AFRICAN REGIONAL WORKING GROUP (AFRWG)

To address the various issues related to agricultural water management specific to Africa, ICID established the African Regional Working Group (AFRWG) in 2000 to promote strong communications and networking among the African countries as well as regional, and international institutions for enhancing cooperation and coordination, and to support integrated river basin development, training, and research issues, and information systems for African needs.

AFFWG organized the first virtual meeting on 15 April 2021 and discussed activities as part of the Road Map to ICID Vision 2030, position paper on Green Revolution in Africa, Training Needs Assessment (TNA) questionnaire, organisation of the 10th International Micro Irrigation Conference in Morocco, etc. The group organized the 32nd meeting of AFRWG on 27 November 2021 in Morocco and discussed the finalization of a position paper on the green revolution in Africa, the organization of online zoom meetings, webinars, training programs, etc. On 10 February 2022, AFRWG organized a virtual meeting and discussed International Research Program for Irrigation and Drainage (IRPID) node and activation of the Northern Africa node. Chair Dr. Wahba finalized the position paper on Green Revolution in Africa for submitting it to ICID Irrigation and Drainage Journal. Similarly, Dr. Mohamed Wahba has finalized the Training Needs Assessment (TNA) questionnaire.

The 4th African Young Professional Forum was successfully organized during Cairo Water Week from 25-27 October 2021. The 4th African Young Professionals Forum was attended by 154 young professionals from Africa, covering 31 African countries. About 6000 members have joined the African Young Water Professionals Forum (Af-YWPF) on LinkedIn and from 43 African countries through WhatsApp groups. Young Professionals are keeping daily in touch with all group members, updating them with all news updates, available reports, online activities, opportunities, etc.

As part of the Capacity Development Training Programme, ICID in association with the Moroccan National Committee on Irrigation and Drainage (ANAFIDE) organized successfully the five-day training program for young professionals from 19-23 November 2021 in Marrakesh, Morocco. About 45 participants from about 15 countries attended the training programme. The 5th African Regional Conference was organized by ANAFIDE in partnership with ICID and the Ministry of Agriculture, Maritime Fisheries, Rural Development, and Water and Forests under the High Patronage of His Majesty King Mohammed VI from 24-27 November 2021 in Marrakech on the theme "Sustainable management of irrigation for a better resilience of agriculture in Africa". About 380 participants from 34 countries participated in addition to the international organizations viz. FAO, World Bank, etc.

The Moroccan National Committee of ICID (ANAFIDE) is organizing the 10th International Micro Irrigation Conference (IMIC) on the theme "Micro Irrigation in the Era of Technology Innovation and Digital Transformation" from 25-27 January 2023 in Dakhla, Morocco.

ASIAN REGIONAL WORKING GROUP (ASRWG)

To achieve the task of doubling the food production in the Asian region, the National Committees from the Asian region have formed the Asian Regional Working Group (ASRWG) to focus on numerous relevant topics of current importance.

Under the chairmanship of Dr. Watanabe, ASRWG organized three online meetings, viz. 08 April 2021, 23 July 2021, and 27 October 2021. During the online meetings, WG discussed various activities as a part of the Road Map to ICID Vision 2030, including the collaboration with IACID for the 9th Asian Regional Conference (ARC9) in 2024, cooperation with PAWEES and INWEPF, updating the WG webpage, etc. Working Group assigned activities under the Road Map of ICID Vision 2030 and established Task Team (TT) for the 9th Asian Regional Conference (ARC9). Working Group is preparing a technical report on "Contribution of Agricultural Water to the Rural Development in Asia" and a Special joint Publication on "Agricultural Water Management for Sustainable Rural Development".

During the 28th meeting of ASRWG held in November 2021 in Morocco, WG organized an Internal Workshop on 'Impacts of COVID-19 pandemic on Agricultural Water Management in Asia'. During the workshop, presentations were made by VP Dr. Mochammad Amron (Indonesia), Dr. Vijay Labhsetwar (India), Dr.Wen-Pin Shu (Chinese Taipei Committee), Dr. Aynur Fayrap (Turkey), Mr. Arthon Suttigarn (Thailand), Mr. Dang Ping (China), and Mr. Bryan Ward (Australia). Mr. Bryan Ward made a brief presentation on the 9th Asian Regional Conference (ARC9) to be held from 01-07 September 2024 in Sydney, Australia, including their plans for collaboration with ASRWG. All these presentations are available on the WG webpage at https://icid-ciid.org/inner_page/104

To facilitate collaboration for ARC9, a Task Team (TT) has been established by the group to discuss important areas of collaboration to ensure that the event is successful and meets the objectives and challenges of ASRWG. The ASRWG has long been cooperating with the International Society of Paddy and Water Environment Engineering (PAWEES) and the International Network for Water and Ecosystem in Paddy Fields (INWEPF) as they have common mutual interests. An online PAWEES 2021 International Conference was held on 29 October 2021, and an INWEPF meeting was held from 02-03 November 2021 in Sri Lanka.

The working group organized the virtual meeting on 28 February 2022 and discussed the progress made in their activities as part of the Road Map to ICID Vision 2030. WG discussed the contents/ structure of the technical report of ASRWG and assigned the tasks among members. WG is planning to organize the International Workshop on 'Agricultural Water Management for Food Security: Beyond Modernization' to be held as part of the 9th ARC during 01-07 September 2024 in Sydney, Australia. ASWRG is planning to organise two other international workshops on the theme (1) Australian experiences on modernization (in 2022) and (2) Towards a resilient Asia: Ensuring a sustainable and equitable future (in 2023).

EUROPEAN REGIONAL WORKING GROUP (ERWG)

To promote awareness about relevant water issues at all levels and to pay special attention to environmentally sustainable water management in the European region, ICID established the European Regional Working Group (ERWG) in 1995 with present representation from 16 member countries.

ERWG organized the first virtual meeting on 20 April 2021 and discussed activities as part of the Road Map to ICID Vision 2030, strengthening the membership in Europe, organizing seminars/workshops/sessions related to agricultural water management in Europe, review of policy documents related to water resources impacting irrigation and drainage sector in Europe, task force on the legislative framework on Agricultural Drought Mitigation Regional (TF-DMD), etc.

ERWG held its 27th meeting on 27 November 2021 and reviewed the Action Plan of 'Road Map to ICID Vision 2030' in respect of achieving the three goals: (1) Strategy B1: Supporting Development of Appropriate Policies: Disseminate the policy paper within ICID; (2) Strategy C3: Promoting Regional Cooperation: Preparation of ICID Europe – brochures; and (3) Strategy F1: Enhancing Institutional Capacity Development in Member Countries: Sharing online NC's work programmes, and activities. In line with the mandate of the WG and its action plan, the group encouraged its members to organize knowledge-sharing events such as workshops, seminars, and conferences.

An e-publication of the review of policy documents related to water resources impacting irrigation and drainage sector in Europe prepared by President Hon. Prof. Bart Schultz (The Netherlands) is available on the ICID website at <https://icid-ciid.org/icid_data_web/euwaterframework.pdf> Prof. Bart Schultz is also developing a summary paper based on the updated version of the existing publication for submission to the Journal on Irrigation and Drainage in 2022.

ERWG includes 7 National Water Management Associations (NWMA), 5 European professional organizations (EPO), and 5 European Water Management Institutes (EWMI). ERWG has 5 Focus Groups that were set up to raise the issues related to the European viewpoint in the technical working groups of ICID and revert to ERWG on the relevant issues within the scope of focus groups. These five focus groups are (i) Focus Group on History (WG-HIST), headed by VPH Laszlo Hayde (Hungary); (ii) Focus Group on Environment (WG-ENV), headed by Mrs. Seija Virtanen (Finland); (iii) Focus Group on Sustainable Drainage (WG-SDR), headed by Dr. Bernard Vincent (France) and Dr. Irena Bondarik (Russia); (iv) Focus Group on Water-Related Risks, headed by Prof. Klaus Röttcher (Germany) and Mr. Olli-Matti Verta (Finland); and (v) Focus Group on Irrigation and Drainage in the States under Socio-economic Transformation (WG-IDSST), headed by VPH Peter Kovalenko (Ukraine).

PH Prof. Bart Schultz delivered a Webinar on the topic 'Role of Safety Standards and Land Subsidence in Sustainable Development and Management of Flood Prone Areas", which is available on the ICID website https://www.icid.org/icid_webinar_18.html.

Key ICID Events and Participation

ICID events are live platforms for the exchange of knowledge and networking among participants and also setting up the agenda, policy, and direction for future ICID activities. They provide ample opportunities for the voices of stakeholders to be heard and to understand various perspectives of sustainable development. Some of the major events of the year are briefly presented below.

ICID Events

The 5th African Regional Conference and the 72nd International Executive Council (IEC) meeting were held at Marrakech, Morocco, partially. The 5th African Regional Conference was held from 24-27 November 2021, along with the pre-Council meetings of ICID. The Opening Plenary (First) Session was held on 26 November 2021, and the Second and Third Session was held virtually on 15 and 16 December 2021 because of travel instructions imposed by the countries around the world in order to contain the spread of newly identified variant of COVID-19, named as `Omicron'.

Major decisions at the 72nd IEC Meeting (Virtual)

The 72nd International Executive Council (Virtual) Meeting of ICID was held on 15 & 16 December 2021 with the participation of Office Bearers in Office, National Committees, Past Office Bearers, Direct Members, and others. Some of the important decisions taken during the IEC meeting and its pre-Council meetings are as follows -

New Vice Presidents: The Council elected (i) Prof. Dr. Tsugihiro Watanabe (Japan); (ii) Er. Aziz FERTAHI (Morocco) and (iii) Er. Alireza Salamat (Iran) as Vice Presidents of ICID for a three-year term from 2021-2024.

Changes in organisational and technical matters of ICID:

- Approved the establishment of the Task Force on International Network of Service Providers for Irrigation Excellence (INSPIRE) under Strategy Theme `Scheme'
- Approved the establishment of the World Register of Irrigation and Drainage Schemes (WIDS)
- Approved the ICID Publication Policy and Guidelines https://icid-ciid.org/icid_data_web/PublicationPolicy2021.pdf

- Approved the organisation of one meeting in every quarter of the year for each workbody under PCSO and PCTA – three virtually and one meeting onsite during the annual IEC meetings.

In addition to the establishment of the Working Groups, the IEC has also extended the date of completion of the mandate of the following Working Group as per details given below:

I. Task Force to Guide ICID Inputs to 9th World Water Forum (TF-WWF9) till 2022
II. Working Group on Environment (WG-ENV) till 2022
III. Working Group on Global Climate Change & Agricultural Water Management (WG-CLIMATE) till 2023
IV. Working Group on Water Saving in Irrigated Areas (WG-WATS) till 2023

In view of the rescheduled and approval to host the future events, the following events will be held as follows:

1) 73rd IEC Meeting and 24th ICID Congress, 3-10 October 2022, Adelaide, Australia

   Theme: Innovation and research in agriculture water management to achieve sustainable development goals; Website: https://www.icid2022.com.au/ Contact: bryan.ward@irrigation.org.au

2) 10th International Micro Irrigation Conference, 25-27 January 2023, Dakhla, Morocco

   Theme: Micro Irrigation in the Era of Technology, Innovation and Digital Transformation; Website: http://anafide.net/ Contact: bartali.h@gmail.com

3) 74th IEC Meeting and 4th World Irrigation Forum, 16-22 April 2023, Beijing, China. Theme: Modernization of Irrigation Systems. Contact: cncid_office@sina.cn

4) 14 th International Drainage Workshop, September 2023, Dushanbe, Tajikistan, September 2023. Theme: Modernization of irrigation and drainage systems for adaptation to climate change and sustainable development. Contact: Dr. Bahrom Gaforzoda, Secretary, TajNCID Gbahrom_75@mal.ru

5) 75th IEC Meeting and 25th ICID Congress, 6-13 November 2023, Vizag, Andhra Pradesh, India. Theme: Tackling Water Scarcity in Agriculture. Contact: rsdte@nic.in, yellark@gmail.com

6) Middle East Regional Conference, March 2024, Saudi Arabia. Theme: Treated Sewage Water Use for Irrigation. Dr. Bahaa K. Helmy, Saudi Arabian National Committee of ICID, baha@mewa.gov.sa, frel@mewa.gov.sa

7) 76th IEC Meeting and 9th Asian Regional Conference, 1-7 September 2024, Sydney, Australia. Theme: Impact of COVID19 on Asian agriculture and food security. Website: http://www.irrigationaustralia.com.au/ Contact: bryan.ward@irrigation.org.au

8) 77th IEC Meeting and 5th World Irrigation Forum, September 2025, Kuala Lumpur, Malaysia. Theme: Challenges and future needs in the modernization of irrigation for food security and sustainability.

Contact: mancidmalaysia@gmail.com

The ICID Working Groups have organised 29 virtual meetings of their members from April 2021 to March 2022.

Memoranda of Understanding (MoUs)

ICID signed MoUs during the 5th Arab Water Forum: The major event to report is the signing of two ICID Memorandums of Understanding (MoU) during the Arab Water Forum held in August Dubai – one with the Arab Water Council (AWC) and the other with the International Center for Biosaline Agriculture (ICBA). The MoU signing ceremonies took place along with the joint thematic sessions by ICID, FAO, IWMI, ICBA, and ICARDA, where a range of agricultural water sector issues was presented and discussed, including water scarcity, food security, climate change, transboundary water sharing, and advanced research on technologies and innovations to solve the pressing problems. The ICID President also participated virtually from the UK and gave a presentation. The sessions were well attended, and the discussions were rich in content.

ICID Signed a Memorandum of Understanding with the Arab Water Council (AWC): ICID and AWC would explore the possibility of cooperation in the areas of activity such as: (a) Identification of knowledge sharing, co-financing and technical assistance opportunities between the Parties for programs and projects in their common member countries, (b) Collaborate in each other's programs related to capacity development, education and training in the field of mutual interest, (c) Collaborate in organizing and delivering Joint technical seminars, webinars, and workshops, (d) Inform and consult each other in cases where either of the Parties proposes to initiate a programme or activity on a subject In which the other Party may have a substantial interest in possible collaboration, (e)) Recognize and Invite the AWC as an observer to the meetings of ICID to participate, without a vote, in the Executive Council/ International Executive Council, ICID Congress/World Irrigation Forums, and, where appropriate, of Its working groups on issues of mutual Interest, (f) Coordination between the Parties with regard to programs and projects In their common member countries With a view to achieving their common development objectives, and (g) Exchange of information between the Parties on their shared experiences and expertise in areas including agriculture water management, flood and drought management, and capacity development programmes.

ICID Signed an MoU with International Center for Biosaline Agriculture (ICBA): Along the same lines as with AWC, the second MoU was signed between ICID and the International Center for Biosaline Agriculture (ICBA) during the forum. ICBA, with a vision for sustainable livelihoods and food security in marginal environments, is on a mission to work in partnership to deliver agricultural and water scarcity solutions in marginal environments. It is strategically engaged in promoting sustainable management of natural resources, providing climate change solutions, and enhancing agricultural value chains to advance sustainable food, feed, and biofuel agri-technologies. ICID and ICBA feel the future potential for mutual growth through cooperation and synergetic activities.

ICID Signs MoU With the International Center for Agricultural Research in the Dry Areas (ICARDA): Er. Ashwin B Pandya, Secretary-General of the ICID, and Mr. Aly Abousabaa, ICARDA Director-General and CGIAR CWANA Regional Director, signed a memorandum of understanding to establish a formal framework for the future collaboration between ICID and ICARDA. This framework aims to build on the expertise and innovation of the two organizations in water management and efficiency while promoting knowledge sharing, collaborative programs, projects, and capacity development activities. The agreement will also build on longstanding relationships with key stakeholders on joint activities such as participation in the recently concluded Arab Water Forum.

The MoU will also draw on each organization's past success in resource mobilization and technical assistance opportunities, as well as push for regional capacity development, education, and training through joint seminars, training, webinars, and workshops. Er. A.B Pandya also invited Mr. Aly Abousabaa, DirectorGeneral ICARDA as an observer to the ICID International Executive Council, ICID Congress/World Irrigation Forums whenever appropriate.

72nd ICID Foundation Day 2021 Celebration

ICID celebrated its 72nd Foundation Day on 24th June 2021. As part of the celebration, an International Webinar on "Sustainability of Agricultural Water Management under Difficult Circumstances" was organized virtually with more than 250 international participants from member countries and partner organizations. ICID President and other office bearers from across the world participated virtually.

He appreciated the key role played by National Committees in driving ICID Mission forward through the Roadmap 2030 in close cooperation with international organizations and experts associated with ICID. He also highlighted the knowledge-sharing and capacity-building initiatives of ICID for the Young Professionals and the stakeholders at large.

Keynote Address was delivered by Mr. Ashok Dalwai, CEO, National Rainfed Area Authority (NRAA), Ministry of Agriculture & Farmers Welfare, Government of India, New Delhi. Mr. Ashok Dalwai congratulated ICID and its members for completing 72 years of successfully developing the irrigation and drainage sector across the globe and wished ICID well in its future endeavours. His keynote address had 3 main themes – efficiency, equity, and sustainability. Mr. S.K. Haldar, Chairman, Central Water Commission (CWC) and Chairman, Indian National Committee on Irrigation and Drainage (INCID), New Delhi, India, was represented by Er. R. K. Gupta, who made a detailed presentation of various Government of India programs for the irrigation and drainage sector. In the second part of the CWC-INCID presentation, Member, CWC emphasized the need for developments in the irrigation water delivery services and listed the current progress of the various Irrigation Modernization projects of the Government. International Water Management Institute's (IWMI), a, the country representative of India, made a presentation on the topic "Agricultural Water Management: Building Resilience to Respond to Shocks and Risks." The Counsellor MASHAV, Embassy of Israel in India, New Delhi made a comprehensive presentation on Israel's holistic approach to water management in agriculture and other sectors as well.

IACID shared his experiences in Australia through a presentation entitled "Sustainability of Agricultural Water Management Under Difficult Circumstances – Keeping Ahead" which explained the approach "go the last mile." It focuses on the crop water requirements of individual users/clients and utilizes a feedback mechanism in the water delivery services.

Representing the Egyptian National Committee of ICID (ENCID), the Director of WMRI-NWRC and the Deputy Chairman of ENCID, demonstrated "The Need for Branch Canal Rehabilitation and Modern Irrigation Systems."

VPH Dr. Yella Reddy, INCID-India, informed the online gathering about the 75th ICID Congress and International Executive Committee (IEC) meeting to be hosted by the State of Andhra Pradesh of India in November 2023. He further added that the preparations are in full swing and enjoy the full support of the Chief Minister of the state who has promised to make the event a grand success. VPH Reddy also highlighted various tourist destinations of the state that the delegates and their accompanying spouses and children could take benefit from during the Congress and IEC meeting.

The floor was opened for discussions, and a participant representing NENCID-Nepal remarked that the technical webinar was very well organized, and he found all the technical presentations very useful for his work in the agricultural water sector of Nepal.

In conclusion, Er. Ashwin B. Pandya, Secretary-General, ICID, thanked the President of ICID, keynote speaker Mr. Ashok Dalwai, ex-Office Bearers of ICID, esteemed presenters, participants, and the ICID Central Office staff for their keen participation in the day's activities and for making the event highly successful. The webinar ended with a round of applause from all participants.

Visit of High Level Dignitaries to ICID Central Office

His Excellency, the Ambassador of Ivory Coast to India, visited the ICID Central Office on 21 June 2021 to interact with the Secretary-General and explore future collaboration opportunities on ICID platforms.

Bangladesh High Commission Secretary (Political) Mr. Zakaria Bin Amjad visited ICID Central Office on 21 June 2021 and was received with a warm welcome. He held interactions with Secretary-General Ashwin Pandya and other ICID officials. SG Pandya briefed him about the ICID, its vision, and the role of ICID in irrigation, agriculture, food security, and water management. He also explained the strategies to achieve ICID goals. Mr. Zakaria Bin Amjad appreciated the work of ICID and its knowledge-sharing platforms of ICID.

H.E. Mr. Lukmon Bobokalonzoda, Ambassador of Tajikistan, paid a visit to the International Commission on Irrigation and Drainage (ICID) Central Office on 22 February 2022. ICID Secretary-General Er. Ashwin B. Pandya welcomed Mr. Lukmon Bobokalonzoda and his team. The visitors had wide-ranging discussions with Secretary-General Er. Ashwin B. Pandya, and other ICID officials. Secretary-General Pandya gave a brief presentation on the various activities of ICID. The presentation highlighted the vital role of Tajikistan as a member of ICID since its inception of ICID in 1950. Mr. L. Bobokalonzoda and Er. Pandya discussed the upcoming DUSHANBE WATER PROCESS 2nd High-Level International Conference on International Decade for Action "Water for Sustainable Development," 6-9 June 2022.

Secretary-General Er. A.B. Pandya's Visit to the African-Asian Rural Development Organization

Secretary-General Er. A.B Pandya paid a visit to the African Asian Development Organization Central Office, New Delhi, on 25 February 2022. SG Pandya and Dr. Manoj Nardeosingh, Secretary-General, AARDO discussed the visions of ICID and AARDO in the framework of food, energy, hunger, and agriculture and how to uplift the standard of living and sustain the SDG's by 2030.

During the meeting, SG A. B. Pandya gave the ICID's new Publication, "ICID Coffee Table Book", to Dr. Manoj Nardeosingh, Secretary-General AARDO, which enriched the journey of the last 70 years of ICID from its foundation.

Er. A. B. Pandya gave the presentation regarding the ongoing activities and upcoming events of ICID, such as the 24 ICID Congress and 73rd IEC Meeting of ICID, Adelaide, South Australia, and the 4th World Irrigation Forum, Beijing, China.

Dr. Manoj Nardeosingh expressed a keen interest in the activities of ICID. He also expressed his appreciation for ICID's role in promoting global collaboration in irrigation and drainage. He gave his full support to ICID on upcoming events under the MoU between ICID and AARDO based on similar goals in food security, water management and hunger.

Rewarding Excellence

With food and water security at the core of its mandate, ICID has constantly been promoting technological innovations for water conservation by individuals and recognizing World Heritage Irrigation Structures. To better document and reward such innovations and structures, ICID has instituted many awards to recognize the innovative work and encourage the researchers for their outstanding contributions, which promotes the judicious use of water in agriculture. All researchers and innovators make use of the ICID platform to share the benefits of their work that addresses the water productivity improvements in the agriculture sector globally. Each year, the best paper in the Irrigation and Drainage journal is also rewarded.

WATSAVE WARDS

The WatSave Awards, instituted in 1997, were established for proven and robust technology, tool, or work that has resulted in saving water in agriculture. The WatSave Awards were presented during the 72nd IEC meeting held at Marrakesh (Partially Virtually), Morocco, in November and December 2021 in - (i) Technology (ii) Innovative Management (iii) Young professional, and (iv) Farmer categories. Each award consisted of an honorarium of US$ 2000 and a Citation.

PH Er. Felix B. Reinders (South Africa), as the Chair of the Panel of Judges for WatSave Award 2021, presented his report and recommended to the Council for bestowing the awards in different categories as below. The research work of the winners awarded during the year is also briefly described below:

Technology Category

It is presented to recognize the best technological applications or projects developed, which have been successful in saving water and/or recovering wastewaters/low-quality waters.

Dr. Abdrabbo Abdel-Azim Abdrabbo Shehata (Egypt) for his work on "Hybrid Irrigation Method for Water Saving in Irrigated Agriculture". This innovative method provides a hybrid between surface and pressurized irrigation methods to overcome the disadvantages of both methods.

Innovative Water Management Category

It is presented to recognize non-technological interventions, innovative land and water management practices, and policy interventions helping increase water availability for different uses. It aims to identify new policies/approaches for water-saving leading to cost-effective and beneficial water use.

Mr. EL Bouari Ahmed (Morocco) for his work on the "First PPP Irrigation Project in the World (El GUERDANE Scheme) in South of Morocco". This innovative

management approach combines government and private sector efforts to improve the technical, economic, and 'financial conditions of the management of the irrigation water service.

Young Professional Category

It is presented to recognize young professionals (below 40 years) contributing to the original research and innovative water-saving techniques, leading towards sustainability.

Dr. Alison Mccarthy (Australia) for her work on Automated site-specific irrigation optimization using 'VARIwise'. This innovation is software 'VARIwise' that combines sensing, modelling, optimization, and actuation to determine site-specific irrigation requirements to maximize yield and crop productivity for broad-acre crops.

Farmer (s) Category

It is presented to farmer or farmer(s) who has successfully developed or implemented water-efficient farming techniques on the farms as well as in the community

Mr. Gholamreza Ansari (Iran) for his work on "Increasing Wheat Water Productivity in Wheat Based System in Iran (Case Study: Darab City)". Local adoption and implementation of conservation agriculture based on crop management are one of the most important aspects of this project.

Best Paper Award

ICID promotes and encourages professionals and experts working in the domain of agricultural water management to share their experiences, research outcomes, and best practices with others through its Journal 'Irrigation and Drainage', which is a prestigious, peer-reviewed publication publishing original papers on scientific, engineering, environmental and socio-economic issues associated with irrigation and drainage. To recognize and incentivize professionals to contribute to the Journal, ICID instituted the 'Best Paper Award' in 2021 for the outstanding paper contributed to the Journal 'Irrigation and Drainage' during the preceding year (January-December).

The Best Paper Award consists of a citation plaque and either US$ 500 cash or US$ 800 worth of Wiley books from M/s Wiley Blackwell (UK). The M/s. Wiley-Blackwell 2021 'Best Paper Award' was jointly awarded to (i) Yan-Ping Wang, (ii) Lin-Sen Zhang, (iii) Yan Mu, (iv) Wei-Hong Liu, (iv) Fu-Xing Guo, and (v) Tian-Ran Chang (China) for their paper titled 'Effect of a root-zone injection irrigation mention method on water productivity and apple production in a semi-arid region in north western China' published in Volume 69, Issue 1 in 01 December 2019 (Pages: 74-85) - https://onlinelibrary.wiley.com/doi/10.1002/ird.2379. The Award was presented during the 72nd IEC Plenary Session held on 26 November 2021 at Marrakech, Morocco. The papers of the Best Paper Awards can be accessed at https://icid-ciid.org/award/best_paper_award/58

Recognition of World Heritage Irrigation Structures (WHIS)

World Heritage Irrigation Structures (WHIS) program recognizes structures (dams, weirs, and other constructed works) that are more than 100 years old and hold an archival value from the irrigation and drainage perspective. WHIS helps trace the history of and understand the evolution of irrigation in civilizations across the world and in preserving these historic structures. A feature of WHIS listing is that, unlike some world heritage honors, ICID recognizes these as structures not only deserve to be preserved but also need to be rehabilitated and maintained to continue to serve communities at large.

Keeping in mind the importance of preservation of our heritage in the agriculture and irrigation sector, the International Executive Council (IEC) Meeting, during its 63rd meeting held in Adelaide, Australia, in 2012, approved the idea for recognition of the Heritage Irrigation Structures (HIS) later renamed as World Heritage Irrigation Structures (WHIS), and accordingly, the scheme was initiated by ICID.

The Chair of the Panel of Judges, VPH Dr. Brian T. Wahlin, PCSO Chairman, presented to the IEC the report on the historical irrigation and drainage structures identified to be recognized as World Heritage Irrigation Structures (WHIS).

The seventh batch of the Heritage Irrigation Structures, included in the ICID Register of World Heritage Structures, was presented a "Plaque," citing the salient features of the WHIS during the 72nd IEC on 26 November 2021. In all, 16 Irrigation Structures (WHIS) from 7 countries were recognized and presented with plaques. Also, they were included in the ICID Register of World Heritage Irrigation Structures. These irrigation structures were:

China (3)	:	(i) Li Canal-Gaoyou Irrigation District, (ii) Liao River Irrigation District, and (iii) Sakya Water Storage Irrigation System
Iraq (2)	:	(i) Hindiya Barrage, and (ii) Waterwheels of Heet
India (4)	:	(i) Kalingarayan Anicut and Kalingarayan Channel System, (ii) Grand Anicut Canal (Kallanai Dam) (iii) Dhukwan Weir, and (iv) Veeranam Tank
Japan (2)	:	(i) Teragaike Pond and Teragaike Waterway, and (ii) Usa Irrigation System
Republic of Korea (2)	:	(i) Gangjin Lotus Small Reservoirs Irrigation System, and (ii) Gudeuljang Irrigated Rice Terraces in Cheongsando
Morocco (1)	:	Khettaras
Sri Lanka (2)	:	(i) Ethimale (Reservoir) Tank Bund, and (ii) Dam Old Sluices of Parakrama

Details of all the approved structures included in the online Register of WHIS are available at **https://icid-ciid.org/award/his/44**

Photo: Madhu Mohanan, Communication Officer, ICID

Knowledge Management and Dissemination

To manage the knowledge processes within the ICID network, the Knowledge Management Division (KMD) at the Central Office of ICID was set up in 2017 based on the recommendations emerging from consultations of the ICID Working Groups on the Knowledge theme and also from various ICID partners. ICID also reviews the existing KM processes in water management organizations throughout the world and suggests future strategies to be adopted by ICID members, partners, and other stakeholders, keeping in view the resources available under the existing institutional framework. ICID is engaged in developing a distribution network for the knowledge base on agricultural water management. It is also working to develop an interactive Knowledge Portal for improved flow within and outside the ICID network. The proposed user-driven KM portal is currently being populated initially with the available ICID literature, reports, papers, publications, and other knowledge resources for the benefit of both the knowledge providers and consumers.

Considering the dominance of climate change in recent years, on the one hand, and the various innovative measures being implemented to counter the negative impacts on the other hand, ICID understands the growing relevance of newer terms in the agriculture and water sector and recommends embracing these newer keywords. Accordingly, ICID has assisted MTD-TF in expanding the list of keywords and technical terms used in the MTD based on a statistical analysis of the frequency of appearance of the technical keywords and phrases in ICID proceedings, reports, transactions, and other thematic publications over the last 5 years. The ongoing thematic issues in AWM involve new keywords which are being captured in this analysis.

To facilitate distance learning during the pandemic, ICID designed and delivered ICID's two online International Certificate Course on (1) Dam and Network Safery in collaboration with Aqua Foundation Academy and (2) Micro-Irrigation Systems in collaboration with ICID's national and international partners. Both the courses received excellent feedback from the participating international professionals.

ICID periodicals such as weekly e-Bulletin, monthly ICID News Update, and quarterly ICID News were timely published throughout the year along with non-periodical technical publications such as research synthesis papers, concept notes, proceedings of certain events, and books. During 2020-21, ICID has intensively focused on the compilation of two major publications of ICID, namely, Water Saving Awards (2009-2020) and World Heritage Irrigation Structures (since the scheme's inception). These books are part of ICID 70th Year Celebrations and are expected to be released during the upcoming major ICID international events.

Several technical articles were published in the Irrigation and Drainage Journal on behalf of ICID as well as in the ICID News during 2020-21 and raised drafts for editorials, prefaces, and forewords of various ICID publications. Two technical articles in the ICID Coffee Table Book – one on the "History of Irrigation" and the other on the "Gender Role in Agricultural Water Management" were also published.

Disseminating Knowledge

Dissemination is an interactive process of communicating knowledge to target audiences so that it may be used to facilitate desired change. The challenge is to improve the accessibility to knowledge assets by users. This means ensuring the physical availability of the knowledge asset to a large proportion of the target audience and making the product comprehensible to those who receive it. Disseminating knowledge assets would be an important contribution to the implementation of the new holistic, and collaborative approach on which the 2030 Agenda for UN Sustainable Development is based. Indeed, knowledge can break down silos and be the most natural integrative factor system-wide and for all the stakeholders in the implementation of the 2030 Agenda. Thus, the dissemination of information, knowledge and sharing of successful experiences in AWM forms an important activity of ICID.

The Commission prioritizes and facilitates the exchange of information among its members and various stakeholders, which is achieved through an amalgam of communication tools/technologies like the Internet, publications (digital and print format), and social media. ICID, through its various technical Working Groups, helps extract, compile and synthesize this knowledge. The Central Office is assigned the responsibility of facilitating, packaging and sharing this knowledge across a wide spectrum of users by making optimal utilization of the information technology. The effort is to appropriately synthesize the interaction between technology, techniques, and people to apply the knowledge so generated effectively.

To help the members stay updated with the latest data, information, and key developments, ICID has taken the initiative to upgrade ICT facilities to meet the growing requirements. An updated, info-rich ICID website and flagship publication 'Irrigation and Drainage' Journal are among the main tools in implementing the dissemination strategy. The dissemination is further facilitated by periodicals, including weekly ICID e-Bulletin, monthly ICID News Update, and quarterly ICID News. Besides, ICID also brings out special publications and reports which document the outcome of the activities of work bodies. National Committees also bring out publications both in print/online format of their specific interest, besides newsletters and journals in their local languages. As part of the new initiative, all the publications in digital format are now freely accessible/ downloadable for registered ICID members through the 'Members' Only' section on the ICID website <http:// www.icid.org/ximlogin/login.php>.

ICID Secretary General's Technical Cobtribution

''With Uneven Rain, River Linking Only Way to Ensure Equitable Distribution''

Interlinking of rivers will help the country fulfil its dream of ensuring equitable distribution of water and, thereby, prosperity for all. There have been several such steps in this direction, and in 1980 a National Perspective Plan was formalised. This involved transfer of water from water surplus basins to water-deficit regions. Somehow, the term 'river interlinking' stuck in the public imagination, though its real name would have been the National Inter Basin Water Transfer Projects.

This article first appeared in the Times of India, a popular Indian Daily <https://timesofindia.indiatimes.com/india/times-face-off-will-the-proposed-ken-betwa-project-solve-the-regions-water-woes-or-destroy-livelihoods-and-ecosystems-experts-are-sharply-divided/articleshow/82441657.cms>.

The Central Office of ICID also participates in various technical activities and gives input in relevant forums. The technical staff of the Central Office contributed to papers and book chapters on relevant topics. Secretary-General jointly edited two volumes of a book on "Water Governance and Management in India", with specialised chapters covering water management's technical and socio-economic aspects. A chapter was contributed to Pre-COP 26 publication on water security under climate change entitled "Climate Change and Its Implications for Irrigation, Drainage and Flood Management" by Secretary-General and Ms. Prachi Sharma, Knowledge Officer. A chapter entitled "Importance of Data in Mitigating Climate Change" was also contributed to the book Hydrological Aspects of Climate Change. Springer Nature Singapore Private Limited has published these books.

Additional knowledge services that are being offered by ICID are mentioned below:

ICID Website

The info-rich ICID website is a doorway to a wide range of information on irrigation, drainage, and flood management and serves as a vital mechanism of communication with NCs, and partner organizations. During the year, the website has gone through many upgrades, which include the Expansion of ICID Register of World Heritage Irrigation Structures (WHIS); Irrigation and Drainage - Products and Services Directory; new Tools/Models; Digital collection of ICID publications/ reports/ transactions; ICID Young Professional's e-Forum (IYPeF); African Young Water Professionals e-Forum (Af-YWPeF); ICID Vision 2030; Live recordings of ICID Webinars; Recordings of the virtual presentations; and information on important ICID events. The new website launched as part of the ICID's 70th Anniversary Celebration has gone through many new changes and additions to serve the growing information

and knowledge needs of the ICID members. The newly introduced features, including "Members Profile" section, Online Multilingual Technical Dictionary on Irrigation and Drainage, and Products and Services, are well received and appreciated. The website is updated regularly and frequently in consultation with the members and partner organizations.

All publications brought out starting from the year 2000 are available in e-Publication (EPUB) format for ICID registered members. Members registered on the ICID website can download an electronic version of ICID publications free of cost through the 'Members' Only' section provided as part of the Members Profile.

During the recent IEC meetings, work body members were requested to undertake the important topics and sub-topics related to irrigation and drainage and further develop them as per their expertise and domain for enriching the "Basic Information" section. Now this section is re-energized with a search integration with the ICID Multilingual Technical Dictionary terms. The updated version can be accessed from <https://icid-ciid.org/Knowledge/basic_term/1/Irrigation>.

The 'Tools and Models' section provides links to open source tools available in the irrigation and drainage sectors, such as Web-based DSS - Design of Micro Irrigation Systems (DOMIS); IrriSEARCH - A tool that aims to bring together all AWM research activities from various NCs on a single forum to help others learn from their experiences; Basin Wide Holistic Integrated Water Management (BHIWA) Model; PODIUM - The Policy Dialogue Model; Multilingual Technical Dictionary (MTD); Water Evaluation, and Planning (WEAP) Model; SALTMED Model live introduction by the ICID President Dr. Ragab Ragab. The section is constantly strengthened through voluntary contributions by experts from various WGs.

Other features of the updated ICID website are as follows:

Integrated Library Management System (ILMS)

Established in 2001, the Text Delivery Services (TDS) has been further improved by expanding its scope to a virtual technical library by adding an ICID technical library catalogue for online searching. While the old TDS database included only Books and Articles for online searching, additional data items such as CD-ROMs, Journals, Maps, and Video/DVDs are now a part of this database. In addition, all digitized ICID publications and documents from the year 1950 onwards are now available in e-format. The digital collections are now being made available for download through 'Members' Only' section provided as part of the "Members Profile" on the ICID website. To develop a dedicated 'One-Stop Knowledge Catalogue' on irrigation, and drainage, selected NCs (Bangladesh, China, Egypt, India, Iran, Italy, Korea, Pakistan, South Africa, Sri Lanka, Turkey, and Zimbabwe) were requested in 'Phase-1' to join the initiative in data building. Some NCs have shown their interest in joining this network, and others are expected to follow suit.

Irrigation & Drainage Products and Services Directory

The online directory lists all the products and services offered by consultants, manufacturing companies, dealers, and other professional institutions dealing in irrigation, drainage, and flood management and helps various stakeholders in locating required business/product information.

The information is presently listed in the following categories, and sub-categories: (a) Consultancy Services (1. Individuals/ Experts/ Freelancers; 2. Organizations); (b) Companies/ Manufacturers/Dealers (1. Company/ Implementing Agency; 2. Dealer/ Distributor/ C ontractor; 3. Manufacturer; 4. Publisher; 5. Software developers/ vendors); (c) Institutions (1. Academic Institutions; 2. Farmers' Associations; 3. Funding Agencies; 4. Government/ Non-Governmental Organizations (NGO)/Not-for-Profit Organizations; 5. Research Institutions; 6. Training Institutions), and (d) Others.

NCs and other stakeholders are making use of this service. NCs and YPs are further encouraged to promote this service by promoting it among consultants, manufacturers, companies, organizations, and software to join and take advantage of the services. A new user-friendly version of the directory was launched as part of the new ICID website development to align with the new technology.

ICID Social Media

Social media makes human interaction much more convenient and faster than real-life human interaction. It makes globalization a reality. Never before were human beings connected as in today's world. Social media has made communication a lot easier than ever before. Now, with a touch of a button, people can communicate with anybody anywhere in the world through various social media sites such as Facebook, Twitter, LinkedIn, and so on.

Organizations worldwide are beginning to understand the importance of social media, which provides an opportunity for an exchange of ideas between members, partners, and other stakeholders. As part of the social media initiative, ICID established a LinkedIn page <www.linkedin.com/in/icidonline>, which has a direct membership of more than 5000 AWM professionals from around the world. Also, the ICID LinkedIn page is part of around 50 international Groups involved in AWM activities, which has a huge membership. ICID also established separate Groups for WG-ENV, ICID Young Professional's e-Forum - IYPeF <https://www.linkedin.com/groups/6990321> has a membership of 1000 plus, and African Young Water Professionals e-Forum < https://www.linkedin.com/groups/12143964/> with 6100 members; as part of the professional network which is open for enriching, and interactive discussions in the public domain.

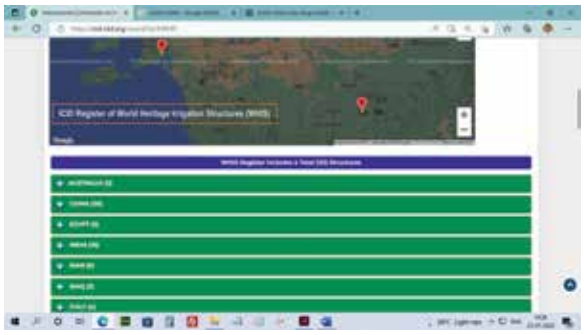
ICID's YouTube channel <http://www.youtube.com/icidonline> is growing fast from the contributions received from members and partners. The channel starts with a welcome message of President Ragab Ragab in both English and Arabic; ICID video; Recordings of the virtual participation; Glimpses of the 5th African Regional Conference (ARC) and 72nd IEC meeting, Marrakesh, Morocco, 2021; World Heritage Irrigation Structures recognized at the 72nd IEC Meeting, Collection on irrigation technologies; ICID Foundation Day Celebrations, and Webinar recordings.

ICID's 'Facebook' page <http://www.facebook.com/icidat> has grown steadily for informal communication between members with common interests, thereby promoting their activities. All the latest developments relating to events, seminars, and conferences are widely circulated through this medium. All NCs are invited to make good use of these new platforms.

Setting up of Dedicated Portals for Contribution Management of Flagship ICID Events

For flagship events of ICID, the activities include collecting, reviewing and communicating with professionals worldwide. Specific workflow processes of ICID events have been captured in a set of dedicated web portals specifically catering to Congress, the World Irrigation Forum and other events that may require such services. The portal processed about 430 abstracts and 150 papers from a uses base of 565 for the forthcoming 24th ICID Congress. It is active for the upcoming World Irrigation Forum as well. The facilities are being provided to National Committees for managing their in-house events.

ICID Register of World Heritage Irrigation Structures (WHIS)



'ICID Register of World Heritage Irrigation Structures (WHIS) includes both old operational irrigation structures as well as those having archival value. A Panel of Judges is set up every year to select historical irrigation/ drainage structures as received from various National Committees (NCs) to give recognition to the historical irrigation structures on the lines of World Heritage Sites (as recognized by UNESCO). A milestone from an administrative perspective has been earmarked as 15 July every year, specifically to enable the International Jury to process them before the next IEC meeting held generally between September-November for inclusion in the 'ICID Register of World Heritage Irrigation Structures.' NCs can nominate a maximum of 4 structures, using separate nomination forms for each structure. Associated

Members and non-member countries can also nominate their structures through the neighbouring active NCs or by submitting their nominations directly to the Central Office. So far, over 105 such heritage structures have been recognized by ICID. For further information on nomination forms, visit <https://icid-ciid.org/award/his/44>.

Publications

The effective management of knowledge has been described as a critical ingredient for an organization seeking to ensure sustainable strategic competitive advantage. One of the important objectives of the Commission is to facilitate the exchange of information among its members and various stakeholders. This objective is achieved through a mix of communication tools/technologies like the Internet, publications (digital and print format), and social media. Dissemination of information, knowledge and sharing of successful experiences in agriculture water management forms an important activity.

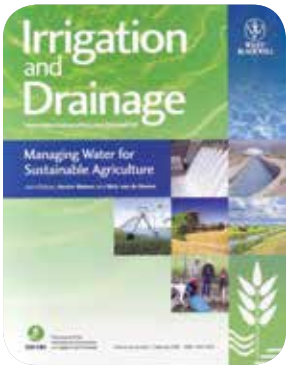
Dissemination of current information and technical knowledge related to irrigation and drainage among professionals across the world remains the core mission of ICID. This is achieved through various publications and the Irrigation and Drainage Journal.

ICID's 70th Anniversary Commemorative Volume (1950-2020)

The ICID@70 Coffee Table Book was released as part of the ICID's 70th Anniversary Celebration, which concluded during the 71st International Executive Council Meeting held virtually in two sessions on 7-8 December 2020.

The publication showcases key milestones achieved by the Commission in its efforts to make a water-secure world free of poverty and hunger through sustainable rural development. The book is also a house of information about the global status of irrigation and drainage, and professionals will find it very useful. The digital version of this publication is now made available on the ICID website: <https://icid-ciid.org/ inner_page/161>

Irrigation and Drainage Journal



Irrigation and Drainage' is not only the official international journal but also the flagship publication of ICID. It is a prestigious, peer-reviewed specialized publication that publishes technical papers on all scientific, engineering, environmental, and socio-economic issues associated with irrigation, drainage, and flood management. The journal is an authoritative publication that doubles up as a rich resource of reference to professionals, engineers, researchers, university professors, and students of irrigation, drainage, and agriculture disciplines. Since 2002, 'Irrigation and Drainage' has entered the ISSN series (ISSN 15310353) and appears in the categories 'Water Resources' and 'Agronomy'. ICID Journal is guided by an International Editorial Board (EB-JOUR) established in 1994. Prof. Jiusheng Li (China) and Dr. Wang Zhen (China) are the Chairman and Secretary of the Editorial Board.

Five issues of the Journal are published every year, along with few extra 'Special Issues' focusing on the current topics of significance almost every year. Special Issue on 'Development for water, food and nutrition security in a competitive environment' (Volume 70, S3) was published in July 2021, which can be accessed at <https://onlinelibrary.wiley.com/toc/15310361/2021/70/3>.

In addition, ICID published articles (two-page write-ups) quarterly in the publication of 'Irrigation and Drainage Journal (2021-22)' as listed below:

- Climate change and its Implications for Irrigation, Drainage, and Flood Management (Volume 70, Issue 4), published in October 2021
- Need for an inventory of Irrigation and Drainage projects and schemes (Volume 70, Issue 5), published in December 2021
- Energy & Food Security through Water (Volume 71, Issue 1), published in February 2022
- Nexus Challenges to Irrigation Institutions (Volume 71, Issue 2), published in April 2022

The impact factor of the Irrigation and Drainage Journal 2020 was 1.328, with a five-year factor of 1.435. To expand the accessibility (Online only) to ICID Journal on Irrigation and Drainage, M/s. Wiley has created a category of 'Individual members of the National Committees' for providing free copies of IRD to all individual members of the National Committees (NCs). The journal can be subscribed to by contacting Mr. Stephen Mullaly, Journal Publishing Manager of M/s. Wile-Blackwell, E-mail: <smullaly@wiley.com>.

To extend the benefits to the developing and least developing countries, M/s. Wiley provides free access to the IRD publications. Under the Research4Life programme, local not-for-profit institutions of select countries may register for access to Irrigation and Drainage for free under AGORA, and OARE. The Journal is accessible online at more than 12,000 institutions worldwide, of which about 7500 are in developing countries. ICID Journal can be accessed through Wiley's Online Library <http://onlinelibrary.wiley.com/journal/10.1002/(ISSN)1531-0361> for all issues published since 2001.

The new volumes are FREE via Wiley online library for all ICID Office Bearers, Work Body Members, and Subscribers through their membership registration number.

New ICID e-Publication:

Publication of the Task Force on Value Engineering for Savings in Irrigation, Drainage, and Flood Management Projects; Compiled and Edited by Dr. Kamran Emami

This publication provides the readers with a glimpse of challenges and the meaning of the 21st Century along with the way forward for financial savings in water projects through the application of the principles of 'Value Engineering'. The same can be downloaded or accessed at: <https://icid-ciid.org/icid_data_web/ TF_VE_e-Publication2021.pdf>.

ICID Contributed a Chapter to the Book "Hydrological Aspects of Climate Change"

The ICID contributed a chapter in the book "Hydrological Aspects of Climate Change". The chapter entitled "Importance of Data in Mitigating Climate Change" aims to promote awareness of data-driven water resource management and describes how climate change can impact the components of the hydrologic cycle, causing changes in the precipitation characteristics, evapotranspiration, surface runoff, snow, and glacier melts, recharge of the groundwater, etc.

e-Publication of the I&D Journal

As a new initiative, Prof. Bart Schultz announced the publication of the 1st virtual issue of Irrigation and Drainage by Wiley. The virtual issues group papers on a specific topic have already been published in the regular or special issues of Irrigation and Drainage since 2000. This initiative is expected to help the readers, researchers, and practitioners to find all the material relating to their field of interest in one place. The first issue has been compiled in consultation with the researcher, and lead author, ICID President Prof. Dr. Ragab Ragab, on the SALTMED model developed by him.

The new volumes are FREE via Wiley online library for all ICID Office Bearers, Work Body Members, and Subscribers. Wiley has provided each ICID Office Bearer, Work Body Member, and Subscriber with a membership registration number. Your e-mail address is your username, and you can choose your password. Click for direct access to the page with the papers of the latest issue of Irrigation and Drainage on: <https://onlinelibrary.wiley.com/toc/15310361/2020/69/3>.

ICID Members can take advantage of Irrigation and Drainage Online as: (a) Papers are available in easy-to-read PDF format, (b) Provides access to the full text of all articles published in Irrigation and Drainage since 2001, as well as Tables of Contents and Abstracts, (c) EarlyView service provides papers online as soon as they have been accepted for publication, which can be several months earlier than the papers published in print, and (d) Sign up for FREE Wiley Alerts – receive the table of contents via email as soon as an issue is published online.

ICID Initiative for a Global Inventory of Irrigation and Drainage Schemes

Irrigated agriculture forms the kingpin of the food and water security of the country and the region. Systematic irrigation is practised through irrigation projects of various sizes, which provide the assured source for a sustainable and timely water supply. Thus, an irrigation project forms the atomic unit of irrigation and water resources

development. Across the world, irrigation is practised under varying agro-climatic conditions and topography and area-appropriate solutions for the same determine the features of individual irrigation projects.

A global view of the irrigation and drainage projects provide great insights into various development approaches followed across the world, their success and their performance. It is observed that the topographic, hydrologic, agronomic and social conditions form a unique combination in which an irrigation project gets planned and implemented. Hence, there is a need to have a global view of the developments which show us the measures adopted and their contexts under a multi-dimensional environment. Attempts are made by various researchers and practitioners to examine specific issues but examination of a project as a whole in a global context requires a repository of information through which the individual projects of interest can be visualized and approached for lessons.

ICID is the only major international scientific and technical organization that, through its membership network, spans across more than 90% of the irrigated areas of the world. The necessity for having a global view of projects devoted to irrigation and drainage is greatly felt by the member countries and also across the world by various agencies. ICID has, therefore, taken the initiative to collect and provide a community knowledge base of irrigation and drainage projects which can work as a common pool resource for understanding the status of development and approaches used for the development and management of the project under varying conditions.

Various registers exist in the field of engineering structures and other entities, the most notable from the water resources angle being the World Register of Dams being maintained by the International Commission on Large Dams (ICOLD). It covers almost 70% of the large dams that provide irrigation benefits. However, details of these dams are not available at a unique location. The proposed register of irrgation schemes fills the gap.

Most registers examined are about structures and individual components of a system, and none record the features of irrigation and/or drainage project on a worldwide scale. National Committees and other irrigation management organizations across the world are invited to contribute to the Register wholeheartedly.

The facility is available <https://wip.icidevents.org/> and it contains video and extensive help for the potential contributors.

ICID News Periodicals

To cover current events and news related to national committees and office bearers and to disseminate information about ICID's flagship activities, various periodicals like e-Bulletin, News Update, and ICID News are released throughout the year. ICID News focuses on technical articles of relevance authored by ICID community members.

Weekly e-Bulletin

The latest developments around the world in the domain of agriculture, climate change, drainage, droughts, floods, food security, irrigation, and water resources management are circulated weekly via e-Bulletin. The latest news items are hyperlinked so that the reader may access the detailed story by clicking on the link. Additionally, it also includes information on upcoming events, the latest publications, webinars, editorials, and opinions, and employment opportunities for the ICID fraternity. More than sixty issues of ICID e-Bulletins have been compiled and sent to NCs, Office Bearers, Work body Members, International Organizations, and other subscribers. NCs, on their part, are encouraged to provide the contact details of their members and interested institutions so that e-Bulletin services could be directly provided to them by the Central Office (icid@icid.org). Past issues of e-Bulletin can be accessed from https://www.icid-ciid.org/members/e_bulletin.

Monthly News Update

ICID publishes the monthly round-up of important news and events in the 'News Update' to offer an insight into the latest developments and various decisions taken by IEC. The issue provides an updated overview of activities that ICID periodically carries out, including international events/conferences/workshops/seminars; new collaborations and engagements; News from National Committees, Direct Members, International Partners, and major upcoming events from around the world. Past issues of the News Update can be viewed at <https://www.icid-ciid.org/member/news_update>. For any contributions, kindly write to icid@icid.org.

Quarterly ICID News

Published quarterly, ICID News includes brief technical articles from eminent professionals on current topics related to AWM. The aim is to disseminate the technical write-ups to non-technical stakeholders. Older issues of ICID News can be accessed at <https://www.icid-ciid.org/member/news>. For any contributions, kindly write to icid@icid.org.

Technical Library

The Technical Library of the ICID Central Office comprises a large collection of technical books, reports, proceedings, and periodicals, besides ICID's publications. All ICID publications, including technical books, reports, proceedings, and workshops, are digitized and available on request.

The library receives about 21 periodicals on a complimentary basis and has more than 32,000 technical reference documents such as development, operation, maintenance, and rehabilitation of irrigation works; flood and drought management; climate change, to name a few. To expand the scope of the library catalogue, NCs can join the online catalogue service by contributing digitally their locally available literature to develop the Integrated Library Management System (ILMS), which is an attempt to serve as 'One-Stop Knowledge Catalogue' for all Irrigation and Drainage related literature to the ICID community, and all irrigation professionals.

Furthermore, the library, with the help of a new online library software on the ICID website <http://ilms.icid-ciid.org/opac/> has 12107 entries under "Articles Section"; and 55 entries in the CD-ROMs/DVD section. The service would be beneficial for all ICID members and NCs as this would provide easy access to all ICID publications.

Capacity Development Activities

To increase water-use efficiencies and water productivity across various stakeholders, especially in the agriculture sector, the adoption of newer and latest technologies and techniques play a significant role. However, the lack of human and other capacities is constraining the sustainable development of irrigated agriculture, and many countries are facing a shortage of qualified technical persons in Agricultural Water Management (AWM). Therefore, it is necessary to provide support and avenues for the capacity development of professionals, particularly young professionals, to assure better utilization of water (and other) resources. Keeping in view the larger benefit of the water fraternity, ICID has initiated several new initiatives and programs to support knowledge dissemination and capacity development of professionals in the AWM sector.

ICID Services

The great challenge for the coming decades will be to increase food production with less water, particularly in countries with limited water and land resources. The effective and sustainable use of water for agriculture has become a global priority of vital importance, requiring urgent and immediate solutions in view of intensifying competition. The importance of Capacity Development for attaining sustainable development in irrigation, drainage, and flood management sectors is fully understood. The consensus among policy-makers in the developing world is that a lack of capacity is constraining the development of irrigated agriculture. Although this concern is not new, it is now receiving much attention in the irrigation, and drainage world, where it is becoming an issue in its own right due to the increasing complexities of development, multi-disciplinary nature of sustainable solutions, close linkages between water-food-energy, rapid changes in the irrigation, and drainage sector, the need to bring together various stakeholders who might not necessarily be experts.

In order to provide technical services to NCs and other stakeholders, ICID established ICID Service Unit (ISU) in 2020. The ISU will help in fulfilling the ICID Vision 2030 for a 'water-secure world free of poverty and hunger through sustainable rural development' to help member countries move towards a sustainable world through professional assistance in the areas of need. ISU will support the organizational goals of Capacity Development of the NCs by (i) Enhancing Institutional Capacity, (ii) Supporting Capacity Development, (iii) Technical Training of Professionals, and (iv) Providing Technical Support to NCs. The Service Unit will support strengthening and empowering NCs by providing them with specific services at a reasonable cost.

The Mission of the ICID Service Unit is: "To be the first people to be called upon to tackle challenges in agriculture water management". The main objectives of the Service Unit are:

- Sharing best practices from around the world,
- Providing direct contribution to the issues faced by NCs,
- Providing practical solutions to the challenges related to agricultural water management, including floods, droughts, and
- Facilitating capacity development and training

As the main aim of the ICID Service Unit is to support NCs and will be run in partnership with them, NCs are envisaged to play a pivotal role in its work. The Service Unit will work in the niche area of capacity development, training, and provision of advisory services on request. The spectrum of products, and services, to be provided by the Service Unit, attuned to the strengths of ICID, are classified into the following three broad categories:

a. Institution building:

- Institutional capacity development includes Stakeholders' interaction and participation.
- Providing information on advanced techniques adopted in the water sector
- Capacity development and management.

b. Training

- Organization of training and workshops
- Certification of professionals
- Organizing study tours and technical exchange programs

c. Advisory

- Policy inputs
- Preparation of status and study reports
- Support for preparation of project proposals
- Program and project evaluation reports, including third-party evaluation of projects and programs
- Rendering expert advises in the fields of water resource planning, design, and implementation.

ICID Young Professionals e-Forum (IYPeF)

At the 65th International Executive Council (IEC) held at Gwangju, Korea, in September 2014, the Council approved establishing an ICID Young Professional's e-Forum (IYPeF) on the ICID platform with open membership to engage all the Young Professionals interested in Agricultural Water Management (AWM) issues. The e-Forum was established as a dedicated Group (https://www.linkedin.com/groups/6990321), now consisting of more than 700 members, to encourage and promote a high standard of professional/expert development amongst the young professionals and to network with the national and international youth having an interest in water-related subjects or the activities, relevant to ICID objectives.

Furthermore, to act as a virtual meeting place, IYPeF also provides a platform for Young Professionals to participate in ICID annual events. IYPeF provides opportunities for budding professionals to interact with the best professionals in the irrigation and drainage sector, participate in e-discussions, organize webinars, present papers, avail the latest information, and join various technical working groups of ICID.

The virtual/online election process of ICID-Young Professional's e-Forum (IYPeF) was held in September 2021 based on the nominations received from the National Committees of ICID for the Coordinator and Joint Coordinator of IYPeF. Er. Ms. Aya Mohammed Hassan Ali Elkholy (Egypt) and Dr. (Ms.) Heidi Salo (Finland) were elected as 'Coordinator' and 'Joint Coordinator' of the IYPeF for the year 2021-2022. To encourage and intensify the active participation of Young Professionals in ICID activities in the domain of irrigation, drainage and flood management, IYPeF is organizing a series of e-discussions and webinars as per their mandate.

Online Training Programs

During the difficult times of the pandemic, ICID kept the knowledge dissemination live through virtual platforms. A few relevant courses were designed and delivered through online systems, providing valuable inputs to both participants and organizers. The two online courses, delivered by field practitioners and related industries, are briefly described here. This provided a well-rounded knowledge of the subjects to the participants,leading to their skill improvement.

ICID-Aqua Foundation Online Certificate Course on Dam and Network Safety Assurance

ICID and Aqua Foundation (AF) are collaborating to offer an online course on Dam and Network Safety Assurance presented by the industry stalwarts and subject matter specialists. Course Content includes (a) Overview of Dam Safety Aspects, (b) Geotechnical Investigations of Existing Dams, (c) Use of Temperature and Strain Sensing for Dams, (d) Latest Developments including Optical Fibre Sensors, and (e) Geophysical Investigation Techniques. The course is delivered through a Learning Management System (LMS), where pre-recorded lectures, videos, presentation, reading material etc. will be uploaded, so that participants can go through these at their own pace, within the time frame of 6 months. Live sessions are also organized wherein participants can directly interact with experts and raise their queries. Course was very well received by the Indian and international audience. Participation from African and Southeastern countries was quite significant. Keeping demands in view, the third batch of the course is currently in progress.

ICID Online Certificate Course on Micro-Irrigation Systems

ICID, in collaboration with the National Water Academy of India and two international industry leaders - Jain Irrigation Systems Limited (JISL) and Netafim Irrigation Private Limited - organized an online certificate course on Micro-Irrigation Systems from October 2020 to April 2021. The faculty team included world-renowned micro-irrigation experts and field research specialists on the adoption of drip and sprinkler systems by farming communities. The course received excellent feedback from more than 150 participants from around the world.

Training Programmes for Young Professionals

4th African Young Water Professionals' Forum in October 2021

The African Young Water Professionals Forum (Af-YWPF) has become an important platform on the African continent for the capacity development of future leaders in water-related sectors. The forum, having more than 6000 members now, exists as an e-Forum (Af-YWPeF) on LinkedIn (https://www.linkedin.com/groups/12143964). The forum promotes participation in the training programs, workshops and conferences, including networking among its members to facilitate knowledge sharing.

As part of the training programme, the 4th African Young Water Professionals' Forum (Af-YWPF) was organized from 25-27 October 2021 (virtually) under the platform of Cairo Water Week (CWW) 2021. The theme of the Forum was 'Water, Population, and Global Change: Challenges and Opportunities". The three-day closed event brought together more than 150 Young Professionals from 31 countries across Africa who participated in the Forum meeting, training sessions, and other activities in convergence with the Cairo Water Week to allow Young Professionals to engage with experts and stakeholders in the water sector through interactive sessions, hands-on training workshops as well as seminars/sessions. The event included seven training sessions, covering the following topics - climate change assessment to inform adaptation, using Aqua-Crop to assess climate change impacts on agricultural productivity, adaptation measures, full and deficit irrigation, adaptation measures: deficit and supplementary irrigation, challenges facing irrigation and drainage in Africa and the way forward, mobilizing youth for a gender transformative approach to water, climate and agriculture projects in Africa – a new model engagement. The Forum was supported by the Ministry of Water and Irrigation of Egypt, United Nations Economic and Social Commission for Western Asia (ESCWA), Arab Center for the Study of Arid and Drylands (ACSAD) of the League of Arab States, Global Water Partnership-Mediterranean (GWP-MED)/GWP Africa Coordination Unit, and the Islamic Development Bank (IsDB). During the Forum, ICID President Dr. Ragab Ragab (UK) gave a keynote at the opening session about current and future water and food security challenges. In his opening remarks Er. Ashwin B Pandya, Secretary-General of ICID, provided a broad overview of ICID's history, vision, and mission, including technical working groups of ICID and its role in cooperating in the development of irrigation and drainage. VPH Dr. Mohamed Wahba, Chairman of AFRWG briefed the participants on the objectives of the establishment of the African Young Water Professionals Forum (Af-YWPF) etc.

Training Programme for Young African Professionals in November 2021

The 5th African Regional Conference (AfRC) on the theme 'Sustainable management of irrigation for better resilience of agriculture in Africa' was organised from 24-27 November 2021 in Marrakech, Morocco. The Moroccan National Committee of ICID (ANAFIDE) hosted the event in partnership with ICID and the Ministry of Agriculture, Maritime Fisheries, Rural Development and Water and Forests under the High Patronage of His Majesty King Mohammed VI.

During the 5th AfRC, a 5-day training program for young professionals was also organized by ANAFIDE from 19-23 November 2021 with the theme 'Micro-irrigation systems to mitigate climate change impacts' under six sub-themes, i.e. (i) Planning and Feasibility Study – Climate Change and Irrigation techniques; (ii) Benefits of participatory approach in development and design – Design of drip irrigation systems; (iii) Management and financial constrains – Operating and maintenance (O&M) of drip irrigation systems; (iv) Introduction of service centers – repair, access to spare parts and irrigation monitoring; (v) Water accounting; and (vi) Risk-based, site-specific, irrigation water quality guidelines.

The objective of the training programme was to provide an opportunity to the young African professionals (Af-YPs) to have a broader and also in-depth exposure to water accounting, emerging irrigation technologies and leadership, and management scenarios and share with the Moroccan experiences in the field of irrigation and water management, considering the urgent need for a sustainable climate change-resilient agriculture sector. 45 young professionals from 15 countries participated in the training programme. This training programme was sponsored by the Chinese National Committee of ICID, Afro-Asian Regional Development Organization (AARDO), and Regional Boards of Irrigation in Morocco (ORMVAs).

Webinars

ICID adopted its vision for 2030 as "A water-secure world free of poverty and hunger through sustainable rural development", and its mission as "facilitate prudent AWM by encouraging interdisciplinary approaches to irrigation and drainage management" in line with the UN Sustainable Development Goals Agenda 2030. The vision of ICID is proposed to be achieved by generating new knowledge, compiling and collating information, sharing experiences, and good practices, disseminating the new knowledge to, and capacity development of the relevant stakeholders. Several approaches and tools are available to undertake capacity development and sharing of knowledge which includes conducting training programs, developing e-Learning modules, and organizing webinars (or web-based seminars). The webinars are customized, keeping in view the requirement of different professionals working in the AWM sector.

Live recordings of the webinars can be accessed at: <https://icid-ciid.org/inner_page/66>

Financial Management

The prudent, visionary and intelligent financial management of an international professional network of voluntary experts is vital to achieving its mission and its goals as it provides the necessary trust among its members. It helps mobilize financial resources and builds the confidence of patrons in a challenging environment that has become increasingly important. Therefore, ICID has put in place a transparent financial system with adequate checks and balances.

Duly audited consolidated financial statement which includes Balance Sheet, Income and Expenditure Account and Receipt and Payment Account for the Financial Year starting from 1 April 2021 to 31 March 2022 are presented on page 80.

FINANCIAL STATEMENTS - BALANCE SHEET AS ON 31ST MARCH 2022

	ASSET	2021-22 (Amount in INR)	2020-21 (Amount in INR)
1	Property & Equipment	94,89,010	97,43,228
2	Receivables	3,41,54,335	2,70,89,168
3	Bank Balances & Cash in Hand	6,61,04,740	10,68,23,971
	Total Assets	**10,97,48,085**	**14,36,56,367**

	LIABILITIES	2021-22 (Amount in INR)	2020-21 (Amount in INR)
1	Gulhati Memorial Lecture Fund	4,30,235	4,08,144
2	General Fund	6,29,64,320	8,85,89,931
3	Gratuity Fund	1,17,84,849	1,14,43,361
4	Leave Encashment Fund	90,99,308	79,79,136
5	Corpus Fund-WID Prizes	29,92,489	28,35,175
6	Support to African (AFYPE)- YP Training	10,74,232	10,74,232
7	Security From Tenant	40,07,404	1,47,29,400
8	Unrealized Subscription	1,39,31,869	1,35,83,190
9	Sundry Creditor, Payables & Provisions	29,93,110	21,48,240
10	Duties & Taxes Payable	4,70,269	8,65,557
	Total Liabilities	**10,97,48,085**	**14,36,56,367**

INCOME AND EXPENDITURE ACCOUNT FROM 01 APRIL 2021 TO 31 MARCH 2022

	INCOME	2021-22 (Amount in INR)	2020-21 (Amount in INR)
1	Membership & Subscriptions	2,01,15,276	1,75,39,280
2	Sale of Publication	12,12,913	16,64,469
3	Special Contribution to the Budget	-	84,09,256
4	Interest on Fixed Deposits	41,55,770	61,41,364
5	Other Incomes	12,85,866	3,81,161
6	Rent and Provision of Services on Let Out Property	1,05,80,306	5,81,36,988
7	Special Subscriptions	3,79,013	11,34,204
	Total Incomes	**3,77,29,144**	**9,34,06,722**

	EXPENDITURE	2021-22 (Amount in INR)	2020-21 (Amount in INR)
1	Compensation for Secretary General	46,34,100	42,53,097
2	Salaries & Allowances	3,08,37,758	2,65,48,822
3	Superannuation Relief to Retd. Employees	46,49,290	39,77,217
4	Service & Maintenance	64,81,005	52,31,964
5	Taxes and Utilities	27,50,424	1,82,33,055
6	Rehabilitation or Refurbishing and Maintenance of ICID Center Office Building	13,63,345	6,34,019
7	Publication, Knowledge Management and Dissemination	47,07,398	46,01,016
8	Conference Expenditure	2,50,191	7,68,097
9	Cooperation with Other Organization	22,183	22,183
10	Travel Expenditure	-	16,56,137
11	Depreciation on Fixed Assets	12,89,820	12,69,741
12	Workshop, Training and Studies	9,37,883	12,25,492
13	Other Expendituer	23,13,561	10,63,990
14	Excess of Expenditure over Income	(2,41,63,951)	2,55,78,029
	Total Expenditures	**3,77,29,144**	**9,34,06,722**

RECEIPT AND PAYMENT ACCOUNT FROM 01 APRIL 2021 TO 31 MARCH 2022

	RECEIPTS	2021-22 (Amount in INR)	2020-21 (Amount in INR)		PAYMENTS	2021-22 (Amount in INR)	2020-21 (Amount in INR)
1	Cash & Bank (Balance Brought Forward)	10,68,23,971	9,80,04,604	1	Compensation package for Secretary General	46,34,100	42,53,097
2	Membership Subscriptions	1,54,18,323	1,47,47,935	2	Salaries and Allowances	2,89,49,860	2,68,98,330
3	Sale of Publications	12,13,652	16,64,469	3	Superannuation Relief to Retired Employees	46,49,290	39,77,217
4	Special Contribution to the Budget	-	84,09,256	4	Services & Maintenances	61,04,434	55,39,277
5	Interest on Fixed Deposits	42,13,545	52,35,295	5	Taxes and Utilities	39,90,194	1,82,51,674
6	Special Subscription	3,79,013	11,34,204	6	Rehabilitation or Refurbishing and Maintenance Of ICID CO Building	13,63,345	6,16,919
7	Other Receipts	6,93,627	3,41,015	7	Publications, Knowledge Management and Disseminations	44,50,511	45,01,920
8	Rent and Provision of Services on Let Out Property	95,22,274	5,81,36,988	8	Conference Expenditure	2,50,191	8,45,977
9	Income Tax Refund	4,18,654	15,75,251	9	Travel Expenditure	16,56,137	-
				10	Workshops, Trainings and Studies	10,03,621	12,87,337
				11	Purchase of Fixed Assets	10,37,092	6,92,234
				12	Other Payments	1,44,89,544	1,55,61,065
				13	Cash & Banks (Balance Carry Forward)	6,61,04,740	10,68,23,971
	Total Receipts	**13,86,83,059**	**18,92,49,018**		**Total Payments**	**13,86,83,059**	**18,92,49,018**

Annexures

Acknowledgements

Country-wise Membership in Workbodies

About 378 professionals from 46 countries contribute to various Committees, Working Groups, and Task Forces directly. Also represented by 17 international organizations in the above workbodies. We thank all our members and partners, who work voluntarily by devoting their valuable time in promoting the mission of ICID.

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	Mr. Krishna Prasad Nepal (WG-HIST)
	Mr. Tikaram Baral (WG-CLIMATE)
	Ms. Jigyasha Rai Yangkhurung - Young Professional (WG-NCWRI)
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	Eng. Mohamed Abdi Mohamud (Provisional Member, AFRWG)
Slovenia	Dr. (Ms.) Rozalija Cvejic (WG-AFM)

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	Prof. Sue Walker (WG-CLIMATE)
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	Mr. Ahmet Şeren (WG-IDM)
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	Mr. Hasan Basri Yuksel (Provisional Member, WG-CDTE), WG-IOA
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	Mr. Philip J. Riddell (WG-IOA)
	Mr. Ian Makin (Chairman, ERWG & M&R), PCTA
	Dr. Ragab Ragab (Chair WG-WFE_N), WG-NWRI, WG-MWSCD, WG-RWH
	Mr. Peter S. Lee (PCTA)
	Dr. Peter Johnson (WG-LDRG)

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	Prof. Kendall C. DeJonge (EB-JOUR)
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	H.E. Dr. Shavkat Rakhimovich Khamraev (PCSO)
	Eng. Karshiyev Rustum Jurayevih (WG-WFE_N)
	Dr. Shukhrat Mukhamedjanov (Vice Chair, WG-IDSST)
	Dr. Mangliyev Abdukhalil Abdusattorovich (WG-LDRG)
Vietnam	Dr. Dao Trong Tu (Provisional Member, ASRWG)
Zambia	Mr. Mulako Cornelius Sitali (AFRWG)

International Organisations

International Organizations	Represented in ICID work body as Permanent Observer
ADB	TF-MTD
AgWA	AFRWG, PCTA
ARID	AFRWG
CIGR	WG-WFE_N
CPWF	PCTA
FAO	PCSO, AFRWG, WG-IDSST, PCTA, WG-CLIMATE, TF-MTD, WG-NCWRI, WG-SON-FARM, WG-WFE_N; WG-SDTA); (WG-M&R and WG-WATS), WG-RWH
GWP	PCSO
ICBA	WG-NCWRI
ICRISAT	WG-WFE_N
ISO	PCTA;
IWHA	WG-HIST
IWMI	PCTA, WG-CLIMATE, TF-MTD , WG-WATS, WG-RWH)
IWRA	WG-IDSST
SARIA	AFRWG
WMO	WG-CLIMATE
World Bank	PCSO, AFRWG, WG-IDSST, PCTA
WWC	PCSO, PCTA

Facts and Figures

1. World Irrigated Area – Developed Countries

S. No.	Country	Total Cultivated Area (arable land + permanent crops) (Mha)	Irrigated Area (Mha)	% irrigated area	Source	Year
1	Australia	47.307	2.15	4.5448	ICID-NC	2017
2	Austria	1.417	0.119	8.398	FAO	2013
3	Bahmas	0.012	0.001	8.3333	FAO	2012
4	Bahrain	0.0046	0.004	86.957	FAO	2001
5	Barbados	0.012	0.005	41.667	FAO	2005
6	Belgium	0.8393	0.019	2.2638	FAO	2013
7	Canada	50.656	1.053	2.0787	ICID-NC	2017
8	Chile	1.746	1.109	63.517	FAO	2007
9	Croatia	0.8908	0.025	2.8065	FAO	2014
10	Cyprus	0.1063	0.055	51.74	ICID-NC	2005
11	Czech Republic	3.219	0.153	4.753	FAO	2011
12	Denmark	2.436	0.439	18.021	ICID-NC	2013
13	Estonia	0.6543	0.003	0.4585	ICID-NC	2017
14	Finland	2.3	0.008	0.3478	ICID-NC	2020
15	France	19.328	2.6	13.452	ICID-NC	2017
16	Georgia	0.1098	0.052	47.382	ICID-NC	2020
17	Germany	12.074	0.639	5.2924	FAO	2010
18	Greece	3.725	1.517	40.725	ICID-NC	2013
19	Hungary	4.585	0.22	4.7983	ICID-NC	2008
20	Ireland	1.059	0.1	9.4429	ICID-NC	2010
21	Israel	0.3977	0.225	56.575	ICID-NC	2004
22	Italy	9.121	2.42	26.532	ICID-NC	2013
23	Japan	4.397	2.882	65.467	ICID-NC	2022
24	Korea, Republic of	1.620796	1.0183	62.825	ICID-NC	2020
25	Kuwait	0.0161	0.01	62.112	FAO	2006
26	Latvia	1.215	0.001	0.0823	ICID-NC	2013
27	Lithuania	2.384	0.004	0.1678	FAO	2011
28	Malta	0.01023	0.004	39.101	FAO	2013
29	Netherlands	1.081	0.486	44.958	FAO	2014
30	New Zealand	0.657	0.619	94.216	FAO	2007
31	Norway	0.8111	0.099	12.206	FAO	2013
32	Oman	0.0688	0.059	85.756	FAO	2004
33	Poland	11.304	0.075	0.6635	FAO	2013
34	Portugal	1.885	0.54	28.647	FAO	2014
35	Puerto Rico	0.111	0.022	19.82	FAO	2005
36	Qatar	0.0156	0.013	83.333	FAO	2004
37	Saudi Arabia	3.647	1.62	44.42	FAO	2014
38	Slovakia	1.413	0.099	7.0064	ICID-NC	2013
39	Slovenia	0.2373	0.007	2.9499	ICID-NC	2011
40	Spain	17.188	3.636	21.154	ICID-NC	2015
41	Sweden	2.597	0.155	5.9684	FAO	2013
42	Switzerland	0.4257	0.04	9.3963	ICID-NC	2007
43	UK	6.279	0.15	2.3889	ICID-NC	2017
44	United Arab Emirates	NA	0.092	NA	FAO	2010
45	Uruguay	2.45	0.238	9.7143	FAO	2011
46	USA	129.516	23.48	18.129	USDA	2017 & 2013

Emerging/ Developing Countries

S. No.	Country	Total Cultivated Area (arable land + permanent crops) (Mha)	Irrigated Area (Mha)	% irrigated area	Source	Year
1	Albania	0.7	0.337	48.4	FAO	2013
2	Algeria	8.4	1.23	14.6	FAO	2012
3	Angola	5.2	0.086	1.7	FAO	2005
4	Argentina	40.2	2.357	5.9	FAO	2010
5	Azerbaijan	2.2	1.43	66.2	ICID-NC	2013
6	Bangladesh	8.5	5.217	61.4	ICID-NC	2017
7	Belarus	5.8	0.03	0.5	FAO	2011
8	Belize	0.1	0.003	2.7	FAO	2005
9	Benin	3.2	0.023	0.7	FAO	2008
10	Bhutan	0.1	0.032	28.4	FAO	2010
11	Bolivia	4.7	0.297	6.3	FAO	2011
12	Bosnia and Herzegovina	1.1	0.003	0.3	FAO	2010
13	Botswana	0.4	0.001	0.2	FAO	2002
14	Brazil	86.6	5.8	6.7	ICID-NC	2013
15	Bulgaria	3.6	0.115	3.2	FAO	2013
16	Cambodia	4.0	0.354	9.0	FAO	2005
17	Cameroon	7.8	0.025	0.3	FAO	2000
18	China	122.5	65.87	53.8	ICID-NC	2017
19	Chinese Taipei	0.8	0.37	46.8	ICID-NC	2020
20	Colombia	3.5	1.087	30.6	ICID-NC	2011
21	Congo, Rep.	0.6	0.002	0.3	FAO	2011
22	Costa Rica	0.5	0.101	18.5	FAO	2013
23	Cuba	3.5	0.557	15.8	FAO	2012
24	Djbouti	0.0	0.001	50.0	FAO	2011
25	Dominican Republic	1.2	0.307	26.6	FAO	2009
26	Ecuador	2.5	1.5	60.5	FAO	2010
27	Egypt	3.7	3.65	97.5	ICID-NC	2017
28	El Salvador	1.0	0.045	4.7	FAO	2012
29	Fiji Island	0.3	0.004	1.6	FAO	2014
30	Gabon	0.5	0.004	0.8	FAO	2011
31	Georgia	0.6	0.432	70.0	FAO	2007
32	Ghana	7.4	0.03	0.4	FAO	2000
33	Guatemala	2.0	0.337	16.9	FAO	2012
34	Guyana	0.5	0.143	31.8	FAO	2012
35	Honduras	1.5	0.088	6.0	FAO	2009
36	India	169.4	62	36.6	ICID-NC	2010
37	Indonesia	46.0	6.722	14.6	FAO	2014
38	Iran	13.9	8.46	61.0	ICID-NC	2019
39	Iraq	7.0	3.55	50.7	ICID-NC	2020
40	Jamaica	0.2	0.03	14.0	FAO	2010
41	Jordan	0.3	0.083	25.8	FAO	2010
42	Kazakhstan	29.5	1.2	4.1	ICID-NC	2013

Emerging/ Developing Countries

S. No.	Country	Total Cultivated Area (arable land + permanent crops) (Mha)	Irrigated Area (Mha)	% irrigated area	Source	Year
43	Kenya	6.3	0.15	2.4	FAO	2010
44	Kyrgystan	1.4	1.02	75.2	FAO	2011
45	Lao People DR	1.7	0.31	18.3	FAO	2005
46	Lebanon	0.3	0.104	40.3	FAO	1998
47	Libya	2.1	0.4	19.5	FAO	2008
48	Macedonia	0.5	0.128	28.3	FAO	2004
49	Malaysia	7.6	0.272	3.6	ICID-NC	2020
50	Mauritania	0.5	0.045	9.8	FAO	2011
51	Mauritius	0.1	0.021	26.6	FAO	2002
52	Mexico	25.7	6.5	25.3	FAO	2014
53	Moldova Repub-lic	2.1	0.228	10.8	FAO	2014
54	Mongolia	0.6	0.084	14.7	FAO	1993
55	Morocco	8.7	1.6	18.4	ICID-NC	2020
56	Myanmar	12.3	2.295	18.6	FAO	2014
57	Namibia	0.8	0.008	1.0	FAO	2002
58	Nicaragua	1.8	0.199	11.1	FAO	2011
59	Nigeria	40.5	0.293	0.7	FAO	2014
60	Pakistan	30.93	19.08	61.1	ICID-NC	2022
61	Panama	0.7	0.032	4.3	FAO	2009
62	Paraguay	4.9	0.136	2.8	FAO	2012
63	Peru	5.5	2.58	46.6	FAO	2012
64	Phillipines	10.9	1.52	13.9	ICID-NC	2008
65	Romania	9.2	3.149	34.2	FAO	2014
66	Russia	124.7	4.5	3.6	ICID-NC	2012
67	Serbia, Republic of	2.8	0.092	3.3	FAO	2011
68	South Africa	12.9	1.6	12.4	ICID-NC	2017
69	Sri Lanka	2.1	0.698	25.9	ICID-NC	2022
70	St. Vincent	0.0	0.001	12.5	FAO	2011
71	Suriname	0.1	0.057	80.3	FAO	2011
72	Swaziland	0.2	0.049	25.8	FAO	2010
73	Syria	5.7	1.341	23.4	FAO	2010
74	Tajikistan	0.9	0.804	92.4	ICID-NC	2013
75	Thailand	23.880	5.56	23.29	ICID-NC	2020
76	Trinidad and To-bago	0.0	0.007	14.9	FAO	2004
77	Tunisia	5.2	0.486	9.3	FAO	2012
78	Turkey	23.9	6.65	27.8	ICID-NC	2020
79	Turkmeni-stan	2.0	1.869	93.5	ICID-NC	2013
80	Ukraine	33.4	0.61	1.5	ICID-NC	2021
81	Uzbekistan	4.8	4.312	90.4	ICID-NC	2016
82	Venezuela	3.4	1.055	31.0	FAO	2008
83	Vietnam	10.2	4.585	44.8	FAO	2011
84	Yemen	1.5	0.68	44.0	FAO	2004
85	Zambia	3.8	0.156	4.1	ICID-NC	2017

Least Developed Countries

S. No.	Country	Total Culti- vated Area (arable land + permanent crops) (Mha)	Irrigated Area (Mha)	% irrigated area	Source	Year
1	Afghan-istan	7.9	3.208	40.6	FAO	2002
2	Burkina Faso	6.1	0.040	0.7	ICID-NC	2015
3	Burundi	1.6	0.023	1.5	ICID-NC	2011
4	Chad	4.9	0.030	0.6	FAO	2014
5	Congo, Dem Rep of	8.0	0.010	0.1	FAO	2011
6	Eritrea	0.7	0.021	3.0	FAO	2011
7	Ethiopia	16.3	0.539	3.3	ICID-NC	2005
8	Gambia	0.4	0.005	1.1	ICID-NC	2011
9	Guinea-bissau	0.6	0.025	4.5	FAO	2011
10	Haiti	1.4	0.097	7.2	FAO	2009
11	Korea, DP Rep.	2.6	0.806	31.2	FAO	2011
12	Lesotho	0.3	0.002	0.7	FAO	2011
13	Liberia	0.7	0.002	0.3	FAO	2011
14	Mada-gascar	4.1	1.086	26.4	FAO	2014
15	Malawi	3.9	0.074	1.9	FAO	2014
16	Mali	6.6	0.378	5.8	FAO	2014
17	Mo-zam-bique	6.0	0.118	2.0	FAO	2010
18	Nepal	2.6	1.510	57.2	ICID-NC	2021
19	Niger	16.0	0.100	0.6	FAO	2014
20	Rwan-da	1.4	0.009	0.6	FAO	2011
21	Senegal	3.3	0.119	3.6	FAO	2011
22	Sierra Leone	1.7	0.030	1.7	FAO	1992
23	Somalia	1.1	0.200	17.8	ICID-NC	2017
24	Sudan	20.0	NA	NA	ICID-NC	2017
25	Tanza-nia	15.7	0.184	1.2	FAO	2014
26	Togo	2.8	0.007	0.2	FAO	2011
27	Uganda	9.1	0.014	0.2	FAO	2012
28	Zimba-bwe	4.1	0.153	3.7	ICID-NC	2017

2. World Drained Area – Developed Countries

S. No.	Country	Total Driained Area (Mha)	Year	Source
1	Australia	2.17	2017	ICID-NC
2	Austria	0.2	1997	ICID
3	Belgium	0.07	1996	ICID
4	Canada	9.46	2017	ICID-NC
5	Chile	0.035	2006	ICID
6	Croatia	0.76	1990	CEMAGREF
7	Cyprus	0.02	2000	ICID
8	Czech Re-public	1.07	2011	ICID
9	Denmark	1.77	2012	ICID
10	Estonia	0.64	2017	ICID-NC
11	Finland	2	2019	ICID-NC
12	France	3	2017	ICID-NC
13	Germany	4.9	1993	ICID
14	Greece	0.52	2002	ICID
15	Hungary	2.3	2003	ICID-NC
16	Ireland	0.254	2010	ICID-NC
17	Israel	0.1	1987	ICID
18	Italy	5.3	2005	ICID-NC
19	Japan	3.039	2022	ICID-NC
20	Korea, Repub-lic of	1.15	2016	ICID-NC
21	Latvia	1.58	1995	ICID
22	Lithuania	2.58	2011	ICID
23	Netherlands	3	2010	ICID-NC
24	Norway	0.61	2012	ICID
25	Poland	4.21	1999	ICID
26	Portugal	0.04	2002	CEMAGREF
27	Puerto Rico	0.02	2000	ICID
28	Saudi Arabia	0.04	1992	CEMAGREF
29	Slovakia	0.6	1997	ICID
30	Slovenia	0.08	2007	ICID-NC
31	Spain	0.3	2014	CEMAGREF
32	Sweden	1.1	1996	ICID
33	Switzerland	0.16	2002	CEMAGREF
34	UK	1.2	2017	ICID-NC
35	USA	47.5	2017	ICID-NC

Emerging/ Developing Countries

S. No.	Country	Total Driained Area (Mha)	Year	Source
1	Albania	0.28	1999	ICID
2	Algeria	0.06	1999	ICID
3	Argentina	0.13	2002	ICID
4	Azerbaijan	0.61	2013	ICID
5	Bangla-desh	1.5	2017	ICID-NC
6	Belarus	3	1993	ICID
7	Bolivia	0.02	2000	ICID
8	Brazil	1.08	2013	ICID-NC
9	Bulgaria	0.08	2000	ICID
10	China	21.14	2017	ICID-NC
11	Chinese Taipei	0.37	2020	ICID-NC
12	Colombia	0.23	1989	ICID
13	Costa Rica	0.04	1999	ICID
14	Cuba	0.33	1997	ICID
15	Dominican Republic	0.03	2000	ICID
16	Ecuador	0.05	1998	ICID
17	Egypt	3.36	2017	ICID-NC
18	El Salvador	0.01	1997	ICID
19	Fiji Island	0.01	2000	CEMAGREF
20	Georgia	0.16	1996	ICID
21	Guyana	0.15	1991	ICID
22	Honduras	0.06	1991	ICID
23	India	5.8	1991	CEMAGREF
24	Indonesia	3.35	1990	CEMAGREF
25	Iran	0.39	2019	ICID-NC
26	Iraq	1.37	2020	ICID-NC
27	Jordan	0.01	2008	ICID
28	Kazakhstan	0.45	2013	ICID-NC
29	Kenya	0.03	2003	ICID
30	Kyrgystan	0.2	2013	ICID
31	Lebanon	0.01	2001	ICID
32	Libya	0.01	2000	ICID
33	Malaysia	0.03	2020	ICID-NC
34	Mexico	5.2	1997	CEMAGREF
35	Mongolia	1.5	2000	ICID
36	Morocco	0.2	2020	ICID-NC
37	Myanmar	0.19	1994	CEMAGREF
38	Pakistan	7.86	2015	ICID-NC
39	Paraguay	0.01	2000	ICID
40	Peru	0.08	2000	ICID
41	Phillipines	2.72	2008	ICID-NC
42	Romania	1.83	2008	ICID-NC
43	Russia	4.78	2007	ICID-NC
44	Serbia, Republic of	0.4	2000	ICID
45	South Africa	0.06	2017	ICID
46	Sri Lanka	0.03	2022	ICID-NC
47	Suriname	0.05	1998	ICID
48	Syria	0.27	1993	ICID
49	Tajikistan	0.33	2013	ICID-NC
50	Thailand	0.16	1997	CEMAGREF
51	Tunisia	0.2	2000	ICID
52	Turkey	3.44	2018	ICID-NC
53	Turkmenistan	1.1	2013	ICID
54	Ukraine	3.33	2020	ICID-NC
55	Uzbekistan	3.3	2014	ICID-NC
56	Venezuela	0.31	2002	ICID
57	Vietnam	1	1994	ICID
58	Yemen	1.5	2000	ICID

3. Sprinkler and Micro Irrigated area

Arranged in descending order of the total sprinkler and micro irrigated area

S.No.	Country	Total irrigated area (Mha)	Sprinkler irrigation (ha)	Micro Irrigation (ha)	Total Spr + MI (ha)	% of total irrigated area	Year of reporting
1	USA	23.480	1,41,21,157	19,78,879	1,61,00,036	68.6	2017&2013
2	China	65.870	37,30,000	52,70,000	90,00,000	13.7	2017
3	India	62.000	30,44,940	18,97,280	49,42,220	8.0	2010
4	Brazil	5.797	38,57,104	6,21,346	44,78,450	77.3	2013
5	Spain	3.636	8,85,000	17,93,000	26,78,000	73.7	2015
6	Russia	4.500	25,00,000	47,000	25,47,000	56.6	2012
7	France	2.600	13,79,800	1,03,300	14,83,100	57.0	2017
8	Iran	8.460	10,02,309	10,15,577	20,17,886	23.9	2019
9	Italy	2.420	9,58,535	4,22,534	13,81,069	57.1	2013
10	South Africa	1.670	9,20,059	3,65,342	12,85,401	77.0	2017
11	Australia	2.150	8,20,000	2,17,000	10,37,000	48.2	2017
12	Turkey	6.650	14,30,000	11,20,000	25,50,000	38.3	2020
13	Saudi Arabia	1.620	7,16,000	1,98,000	9,14,000	56.4	2004
14	Canada	1.053	6,83,029	6,034	6,89,063	65.4	2017
15	Azerbaijan	1.437	6,10,000	100	6,10,100	42.5	2018
16	Mexico	6.200	4,00,000	2,00,000	6,00,000	9.7	1999
17	Egypt	3.650	4,50,000	1,04,000	5,54,000	15.2	2017
18	Germany	0.540	5,25,000	5,000	5,30,000	98.1	2005
19	Japan	2.893	-	-	-	0.0	2020
20	Ukraine	0.61	5,40,500	69,500	5,10,000	100.0	2021
21	Romania	1.500	4,48,000	4,000	4,52,000	30.1	2008
22	Slovak Rep.	0.313	3,10,000	2,650	3,12,650	99.9	2000
23	Israel	0.231	60,000	1,70,000	2,30,000	99.6	2000
24	Morocco	1.600	90,000	6,00,000	6,90,000	43.1	2020
25	Hungary	0.220	1,85,000	7,000	1,92,000	87.3	2008
26	Iraq	3.550	42,000	20,000	62,000	1.7	2020
27	Moldova	0.228	1,45,000	15,000	1,60,000	70.2	2012
28	Syria	1.280	93,000	62,000	1,55,000	12.1	2000
29	Korea, Rep. of	1.018	71,000	80,599	1,51,599	14.9	2020
30	UK	0.150	1,05,000	6,000	1,11,000	74.0	2017
31	Finland	0.008	7,000	1,000	8,000	100.0	2020
32	Portugal	0.630	40,000	25,000	65,000	10.3	1999
33	Malawi	0.055	43,193	5,450	48,643	88.4	2000
34	Sudan	1.890	42,000	-	42,000	2.2	2012
35	Chile	1.090	16,000	23,000	39,000	3.6	2006
36	Chinese Taipei	0.370	12,631	13,148	25,779	7.0	2020
37	Bulgaria	0.588	21,000	3,000	24,000	4.1	2008
38	Czech Rep.	0.153	11,000	5,000	16,000	10.5	2011
39	Philippines	1.520	7,175	6,635	13,810	0.9	2004
40	Poland	0.100	5,000	8,000	13,000	13.0	2008
41	Uzbekistan	4.312	5,000	2,000	7,000	0.2	2017
42	Malaysia	0.272	2,000	5,000	7,000	2.6	2020
43	Macedonia	0.055	5,000	1,000	6,000	10.9	2008
44	Nepal	0.472	-	-	5,000	1.1	2020
45	Burkina Faso	0.040	4,500	280	4,780	12.0	2015
46	Estonia	0.003	100	500	600	20.0	2017
47	Georgia	0.052					2020

Emerging/ Developing Countries

Arranged in descending order of the total sprinkler and micro irrigated area

S.No.	Country	Total irrigated area (Mha)	Sprinkler irrigation (ha)	Micro Irrigation (ha)	Total sprinkler + MI (ha)	% of total irrigated area	Year of reporting
1	USA	23.480	14121157.000	1978879.000	16100036.000	68.569	2017&2013
2	Spain	3.636	8,85,000	17,93,000	26,78,000	73.7	2015
3	France	2.600	13,79,800	1,03,300	14,83,100	57.0	2017
4	Italy	2.420	9,58,535	4,22,534	13,81,069	57.1	2013
5	Australia	2.150	8,20,000	2,17,000	10,37,000	48.2	2017
6	Saudi Arabia	1.620	7,16,000	1,98,000	9,14,000	56.4	2004
7	Canada	1.053	6,83,029	6,034	6,89,063	65.4	2017
8	Germany	0.540	5,25,000	5,000	5,30,000	98.1	2005
9	Japan	2.882	-	-	-	0.0	2021
10	Slovak Rep.	0.313	3,10,000	2,650	3,12,650	99.9	2000
11	Israel	0.231	60,000	1,70,000	2,30,000	99.6	2000
12	Hungary	0.220	1,85,000	7,000	1,92,000	87.3	2008
13	Korea, Rep. of	1.018	71,000	80,599	1,51,599	14.9	2020
14	UK	0.150	1,05,000	6,000	1,11,000	74.0	2017
15	Finland	0.008	7,000	1,000	8,000	100.0	2020
16	Portugal	0.630	40,000	25,000	65,000	10.3	1999
17	Chile	1.090	16,000	23,000	39,000	3.6	2006
18	Czech Rep.	0.153	11,000	5,000	16,000	10.5	2011
19	Poland	0.100	5,000	8,000	13,000	13.0	2008
20	Estonia	0.003	100	500	600	20.0	2017
21	Georgia	0.052					2020

Emerging/Developing Countries

S.No.	Country	Total irrigated area (Mha)	Sprinkler irrigation (ha)	Micro Irrigation (ha)	Total sprinkler + MI (ha)	% of total irrigated area	Year of reporting
1	China	65.870	37,30,000	52,70,000	90,00,000	13.7	2017
2	India	62.000	30,44,940	18,97,280	49,42,220	8.0	2010
3	Brazil	5.797	38,57,104	6,21,346	44,78,450	77.3	2013
4	Russia	4.500	25,00,000	47,000	25,47,000	56.6	2012
5	Iran	8.460	10,02,309	10,15,577	20,17,886	23.9	2019
6	South Africa	1.670	9,20,059	3,65,342	12,85,401	77.0	2017
7	Turkey	6.650	14,30,000	11,20,000	25,50,000	38.3	2019
8	Azerbaijan	1.437	6,10,000	100	6,10,100	42.5	2018
9	Mexico	6.200	4,00,000	2,00,000	6,00,000	9.7	1999
10	Egypt	3.650	4,50,000	1,04,000	5,54,000	15.2	2017
11	Ukraine	0.510	4,40,500	0.0695	5,10,000	100.0	2020
12	Romania	1.500	4,48,000	4,000	4,52,000	30.1	2008
13	Morocco	1.600	1,89,750	8,250	1,98,000	12.4	2014
14	Iraq	3.550	42,000	20,000	62,000	1.7	2020
15	Moldova	0.228	1,45,000	15,000	1,60,000	70.2	2012
16	Syria	1.280	93,000	62,000	1,55,000	12.1	2000
17	Sudan	1.890	42,000	-	42,000	2.2	2012
18	Chinese Taipei	0.370	12,631	13,148	25,779	7.0	2018
19	Bulgaria	0.588	21,000	3,000	24,000	4.1	2008
20	Philippines	1.520	7,175	6,635	13,810	0.9	2004
21	Uzbekistan	4.312	5,000	2,000	7,000	0.2	2017
22	Malaysia	0.272	2,000	5,000	7,000	2.6	2020
23	Macedonia	0.055	5,000	1,000	6,000	10.9	2008

Least Developed Countries

S.No.	Country	Total irrigated area (Mha)	Sprinkler irrigation (ha)	Micro Irrigation (ha)	Total sprinkler + MI (ha)	% of total irrigated area	Year of reporting
1	Malawi	0.055	43,193	5,450	48,643	88.4	2000
2	Nepal	0.472	-	-	5,000	1.1	2020
3	Burkina Faso	0.040	4,500	280	4,780	12.0	2015

Country Category

S.No.	Country	Total Irrigated Area (Mha)	Sprinkler Irrigation (ha)	Micro Irrigation (ha)	Total Sprinkler + MI (ha)	% of total irrigated area	% Sprinkler	% Micro Irrigation	% Total Sprinkler + MI
1	Developed Countries	44.360	2,08,98,621	50,52,496	2,59,51,117	58.50	51.80	31.76	46.13
2	Emerging/ Developing Countries	183.909	1,93,97,468	1,08,50,178	3,02,47,646	16.45	48.08	68.20	53.77
3	Least Developed Coun-tries	0.567	47,693	5,730	58,423	10.30	0.12	0.04	0.10

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